

# INFORMATION SERVICES INDUSTRY FORECAST

1985 - 1990

INPUT



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# INFORMATION SERVICES INDUSTRY FORECAST, 1985-1990

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# INFORMATION SERVICES INDUSTRY FORECAST 1985-1990

## ABSTRACT

This report provides the five-year forecasts of the U.S. information services market for the period 1985-1990.

The forecast data includes the four major delivery modes, industry sector data, and other detailed forecasts. It includes the size and growth rates for the period and is a supplement to the four delivery mode annual reports.

There is also a discussion of the direction of the industry and a complete reconciliation of the forecasts to the previous report in 1984.

This report contains 137 pages, including 74 exhibits.



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## I INTRODUCTION



## I INTRODUCTION

- This report is produced as part of INPUT's Market Analysis and Planning Service for the Information Services Industry in the United States.
- Information Services is composed of the following modes of service:
  - Processing/network services.
  - Professional services.
  - Software products.
  - Turnkey systems.
- Each of these services is defined in detail in Appendix A, Definitions.
- Forecasts are produced in terms of current dollars. Inflation assumptions for the forecast are:
  - 1985 - 3%.
  - 1986 - 4%.
  - 1987 - 5%.
  - 1988-1989 - 6%.



- Each mode of service has a different factor as a proportion of the annual inflation rate dependent on labor content:
  - Processing services - 70%.
  - Professional services - 100%.
  - Software products - 80%.
  - Turnkey systems - 40%.
- The forecasts are based on a steady annual growth rate in the GNP of 3-4%. No allowance is made for recessions or periods of rapid expansion. INPUT believes that the economy is becoming more volatile and that dramatic swings in quarter-to-quarter GNP performance will occur. These will impact short-term and long-term growth rates--the more volatile the actual GNP performance, the lower the overall growth rate will be because of the problems inherent in this industry in adjusting to changes. These problems relate to the high labor content of the industry.
- The forecasts are for user expenditures (not vendor revenue). Thus, "double counting" is excluded. User expenditure forecasts are noncaptive services only; i.e., they exclude expenditures by a company with its captive service organization--Boeing Aircraft with Boeing Computer Services, for example.
- We welcome comments or questions on the forecasts and are happy to address any issues clients wish to discuss.

## II EXECUTIVE SUMMARY

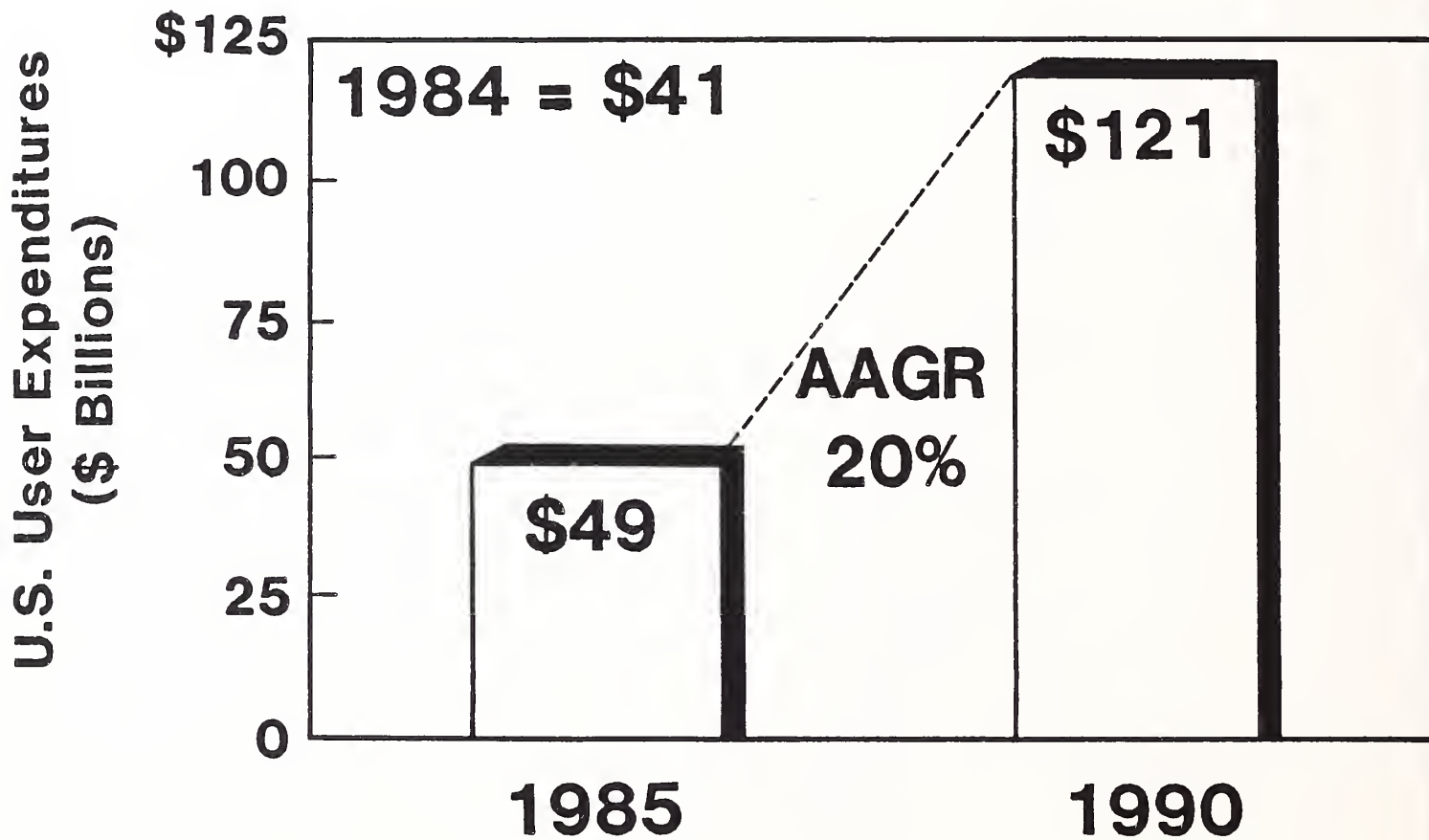


## II EXECUTIVE SUMMARY

### A. INFORMATION SERVICES INDUSTRY GROWTH AND STRUCTURE

- Although overall growth in the information services business slowed substantially in 1985 (from 22% in 1983-1984 to 17% in 1984-1985), INPUT expects that growth in the industry will accelerate and average 20% over the next five years, as shown in Exhibit II-1.
- This growth rate is slightly lower than forecast in 1984 for several reasons. One is that the inflation rate assumption used in 1984 was 6% per year for the period 1984 to 1989. Based on outside econometric forecasts, INPUT has used inflation rates of 3% for 1985, 4% for 1986, 5% for 1987, and 6% for 1988 through 1990. These lower inflation rates will be reflected in slightly lower growth rates. Other reasons for the slowdown are discussed in the summaries for each of the market segments that follow.
- However, vendor characteristics in the market will change appreciably:
  - Computer manufacturers will increase their share as they seek to retain margins eroded by rapidly declining hardware prices. IBM, Burroughs, Sperry, Digital, and Wang are aggressively expanding their revenue base in this industry.



**INFORMATION SERVICES MARKET**

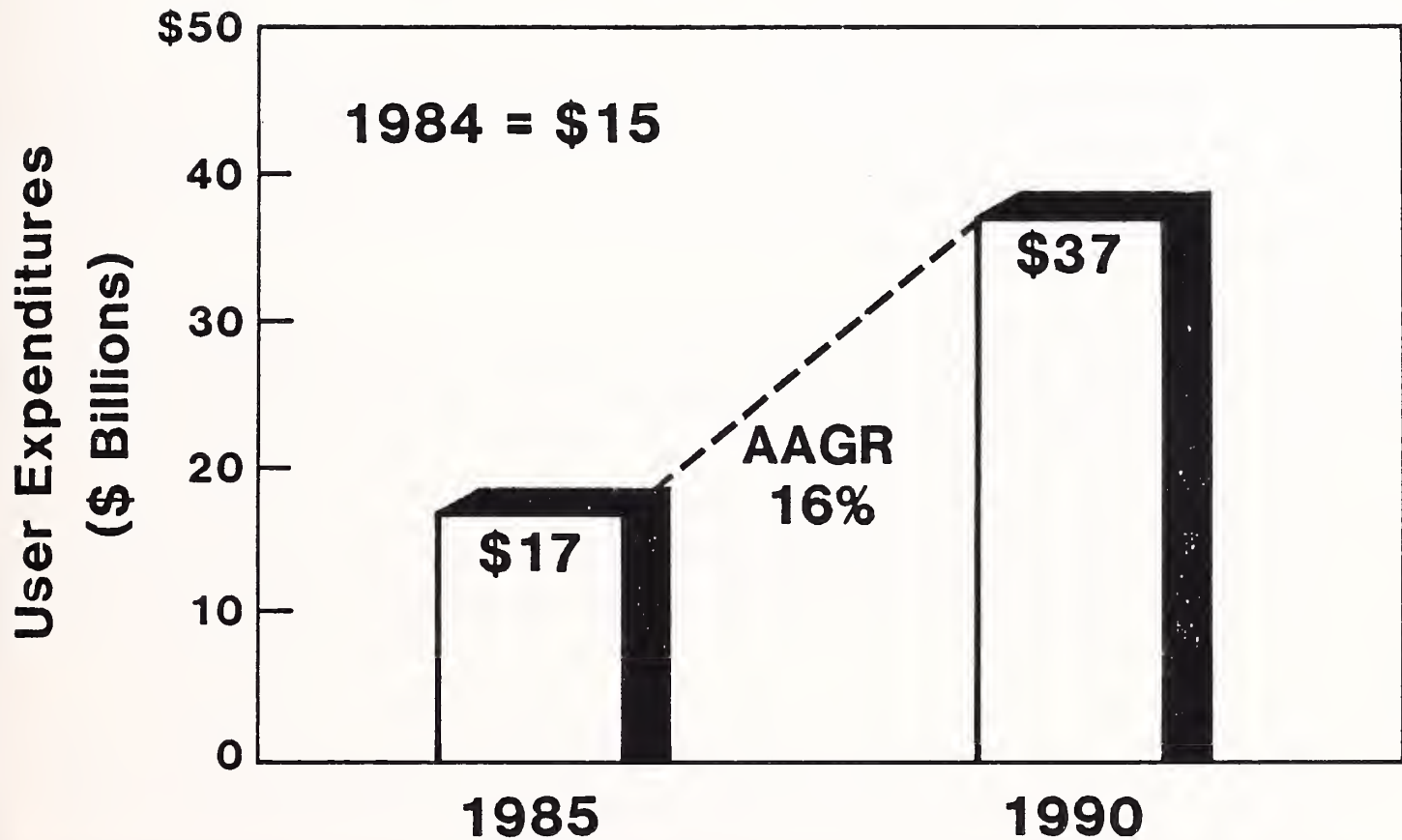
- Communications companies, particularly the Regional Bell Operating Companies (RBOCs), will target network services and software as they seek to add value to their "commodity" communications services.
  - Information companies like Dun & Bradstreet will deliver an increasing amount of their product electronically.
  - Companies from other industry sectors, notably finance and banking, will offer specialized services which extend their normal product/service lines. Such companies will include distributors, transportation companies, and utility companies, as well as the traditional large manufacturers.
- The influx of large companies into the market will be tempered, however, by the recent poor results of many traditional vendors and of other large companies that have ventured into the industry.
- CONTEL, which has sold or is in the process of selling companies it acquired hastily, such as STSC and EXECUCOM.
  - United Telecommunications, which assembled a range of companies since sold to CDC and others.
  - Control Data Corporation, which has itself had serious setbacks in several traditional services areas.
  - General Electric, where the GEISCO subsidiary has lost a lot of its momentum and failed as yet to successfully make the transition from being a timesharing services company.
  - McDonnell Douglas Information Systems Corporation, which is trying to digest a multitude of different businesses (26% of which come from its acquisition of Tymshare).

## B. PROCESSING/NETWORK SERVICES MARKET

- INPUT predicts the growth in this sector of the industry will gradually accelerate so that expenditures will have doubled by 1990, as shown in Exhibit II-2.
  - The growth in 1984 was predicted by INPUT to be 12% while it was actually 16%.
  - In 1985, this segment probably grew at about 12% compared to a prediction of 14%. This is despite some severe setbacks in traditional services.
- The fundamental reason for the acceleration in growth rate is the change of emphasis in user demand and vendor services from computing cycles to network connectivity. This is represented by the change in name from processing to processing/network services.
- Additionally, many services bought by customers are not "computing," but "processing."
  - The classic example of such services are payroll services. DDP, Bank of America, and Paychex all "grew" their payroll services substantially in 1985 and will continue to do so. Not only is the market far from saturated, there are also major opportunities for associated additional services such as processing of employee benefits, health self-insurance systems, pension plans, etc.
  - Processing in third-party situations such as correspondent banking, credit card authorization, and claims processing also offers opportunities.

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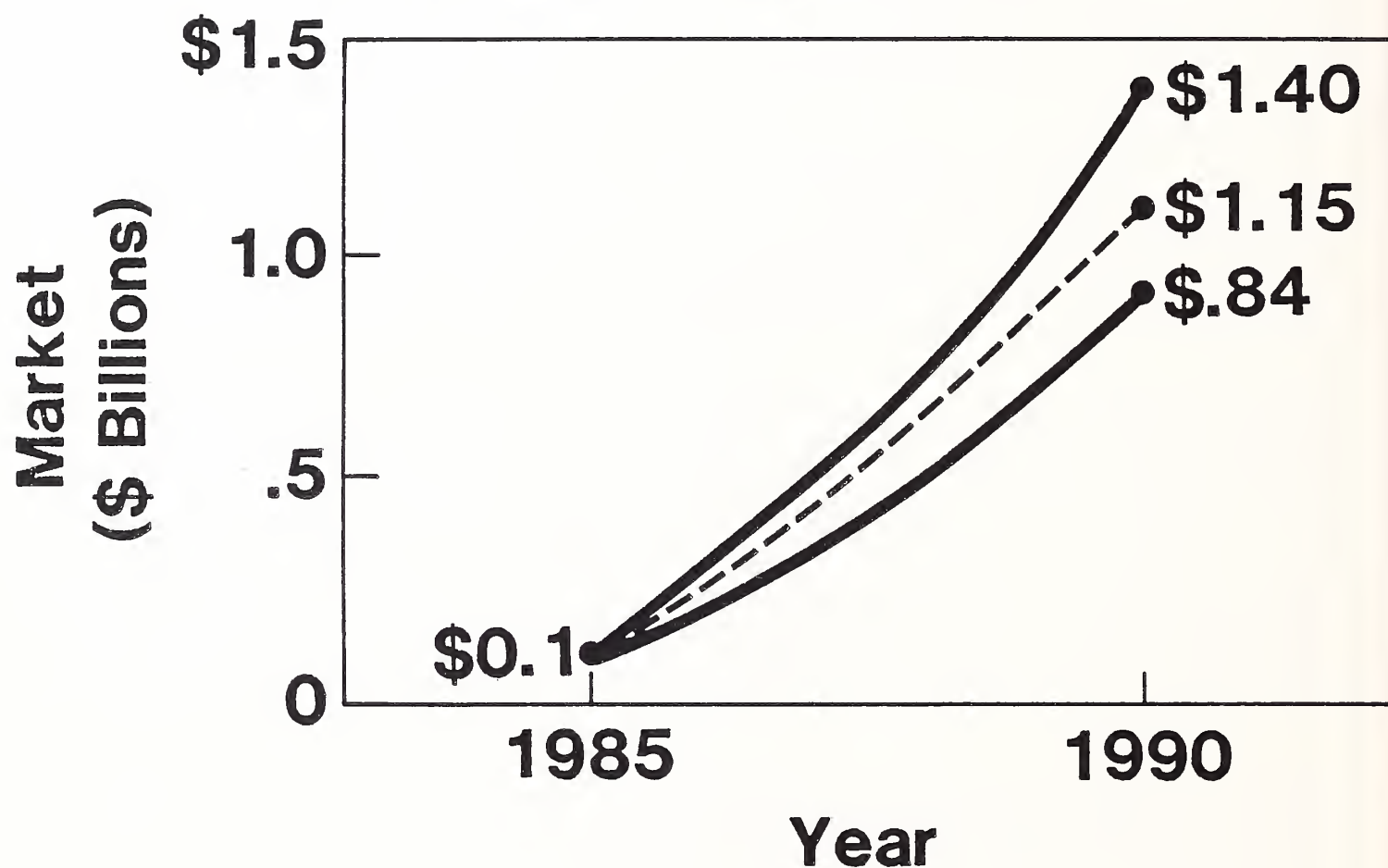
## PROCESSING/NETWORK SERVICES MARKET





- In the above context, it is noteworthy that ADP went through the \$1 billion a year revenue level in 1985, the first independent company to do so. EDS went through the "barriers" in a blaze of glory with its acquisition by General Motors.
- EDS itself continues to expand its processing services outside the GM environment. It has recently obtained facilities management contracts in Europe and the U.S. based on its ability to run major computer/communications facilities effectively.
- This need for effective systems will drive medium-sized organizations in many industries toward facilities management (FM) or commercial systems integration. Industry-specialized organizations such as EDS, Systematics, and MTech will continue to expand.
- Information distribution services will become the fastest growing and potentially the largest part of this industry segment. There are two basic kinds of information distribution.
  - Information aggregation (IA) where a vendor or a third party aggregates information on a particular area and sells access to that information.
    - INPUT has called this the "on-line data base market." However, this term is no longer accurate in that we are often dealing with text, graphics, and other forms of information, not just "data."
    - Also, the remote distribution through compact disks (CD-ROMs) will impact the "on-line" characteristic. Typically, vendors will produce and store historic archival or other nonvolatile information on CDs for delivery to clients for operation on personal systems or through information centers. Volatile information will continue to be delivered electronically.

- Examples of information aggregation services include Dun & Bradstreet and TRW credit services, Dow Jones Information Services, Lockheed's Dialog service, and the financial quotation services such as Quotron, Telerate, and ADP.
  - The key here is for vendors to either add considerable value to the information aggregated through analysis or combination, or to own the information base.
- Information switching where the information is not aggregated and the vendor does not "own" it. The vendor identifies, organizes, and switches the information from a source to a receiver. Essentially, the vendor provides a communicating service.
- "Electronic mail" is one such service which fits these criteria. It is growing rapidly on internal systems within organizations, often piggybacking on systems set up to perform other functions such as information center computers. The service opportunity lies primarily in communicating among different organizations. For example, the General Services Administration is now using electronic mail for the submission of certain responses to requests for proposals (RFPs).
- Voice processing services are beginning to grow rapidly. Many companies are experimenting with internal systems from companies such as VMX; others are using services such as those from VoiceCom, a San Francisco-based service company. Services become valuable when they allow intercompany voice-box messaging. In fact, voice processing services will limit the growth of electronic mail. If it is not necessary to have a paper record, there will be no need to keep the information.
- Electronic Data (Document) Interchange (EDI) is forecast by INPUT to grow extremely rapidly, as shown in Exhibit II-3. Some have questioned the rapid

**EDI MARKET GROWTH**

growth of EDI, contrasting it with forecasts of the "checkless society" prevalent in the early 1970s (not from INPUT, it should be noted). However, there are compelling reasons for the growth of EDI.

- One reason is that the cost per electronic transaction is declining and will decline from approximately a \$1.00 today to less than \$0.50 by 1990 while the cost for other transaction forms, particularly paper, is increasing.
  - The major reason though, as always, is "time"--EDI saves time. In manufacturing, for example, it is virtually impossible to operate a "kanban," just-in-time system using paper-based interfaces. In Japan, most secondary factories are close to the primary factory. That is not the case in the U.S. where distances and transportation times are much greater. These are compelling reasons for EDI--that is why it will grow.
  - The negative factors affecting its growth are the potential problems in legal and accounting processes. The lack of standards is important, but not as much as may be thought. "Standards" are being imposed by the big companies such as GM.
- Another processing/network service area analogous to EDI is that of electronic banking. With increasing and contradictory pressures on them to reduce costs and expand services at the same time, medium-sized financial institutions in particular are targets for systems and services. Networks to support Automated Teller Machines (ATMs) are most often operated by a bank itself or a consortium, as are point-of-sale (POS) networks which tie retailers and banks together. There are network service opportunities for shared services in these areas. Also, automated clearinghouse (ACH) services are increasing in demand. To these markets can be added credit card and check authorization services and credit/debit card processing.



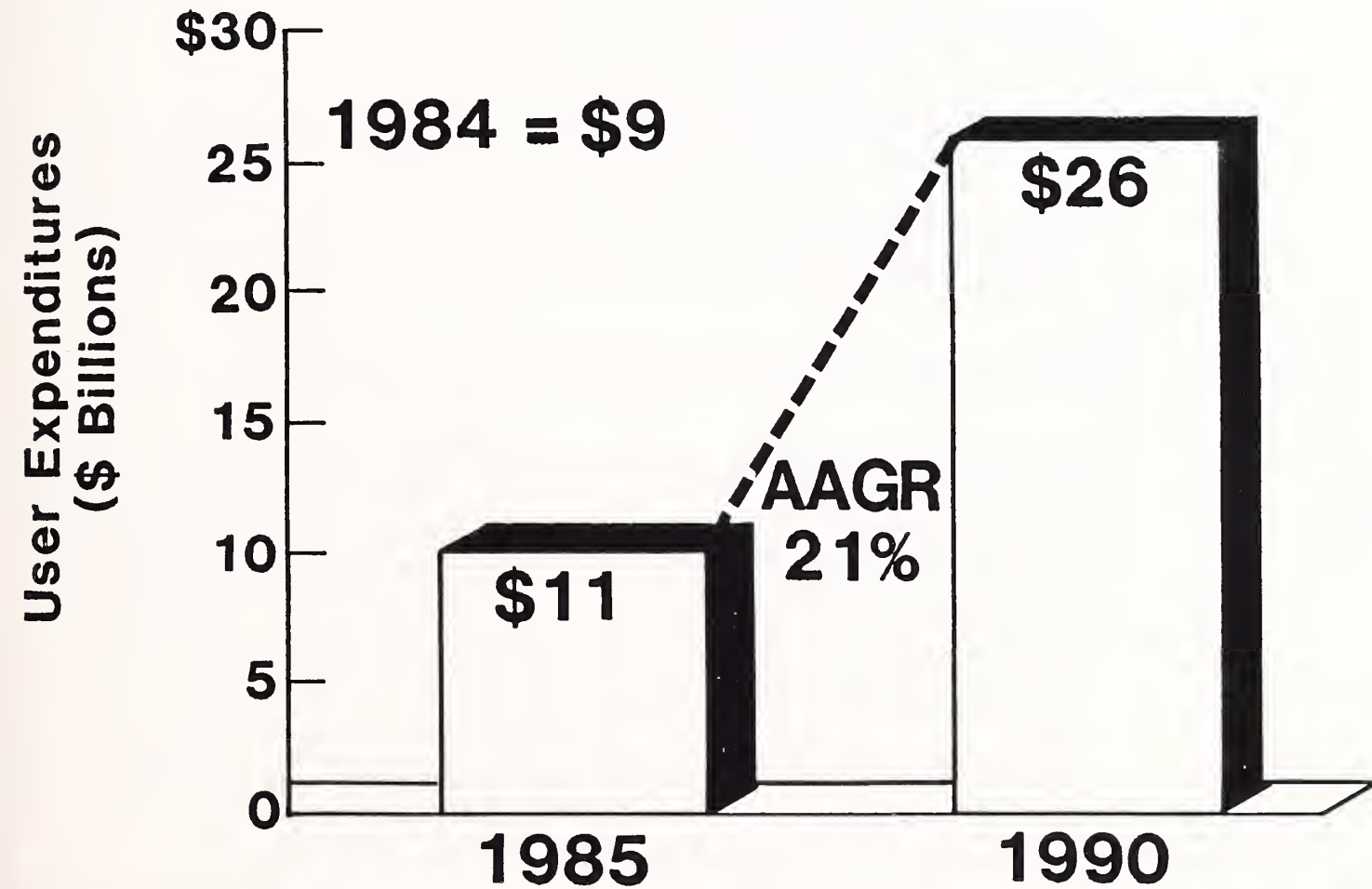
- As some processing/network services expand, others are shrinking, the most noteworthy being the single-user, single application, problem-solving activity which used to be carried out on "timesharing" and has almost completely been transferred to personal computers.

### C. PROFESSIONAL SERVICES MARKET

- INPUT forecasts professional services markets in the U.S. will grow at 21% over the next five years, as shown in Exhibit II-4--the same as was forecast last year. However, this may be an understatement of the market growth for several reasons.
  - "Price increases" due to the movement from commodity to specialized services.
  - Increased demand for services of all kinds due to the unavailability of internal resources.
- Professional services vendors are providing two different types of services.
  - Commodity services, providing people with required characteristics to customers on a time and materials basis. This is traditionally known as "body-shopping."
  - Value-added services where the contractor takes responsibility for a project, has specialized expertise, or a combination of both. The ultimate expressions of these services are systems integration contracts in the manufacturing and banking industries.
- In the commodity professional services there are a number of emerging trends.

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## PROFESSIONAL SERVICES MARKET



- Rapid growth of "brokers" such as VLI and Computer People. These companies satisfy customer demands for certain types of people by searching them out and contracting with them to be "temporary help." The staff may not be employees of either the customer or the vendor. The staff work is directed by the customer. The vendor takes a markup on the compensation (fee/salary) of each individual of 25-30%. It is not unusual for a broker to have tens and sometimes hundreds of people placed in the same account.
- The association of organizations with product companies, such as CGA with Cullinet, in order to develop differentiation and specialization. This is happening with both applications and applications development product companies.
- In the value-added service area the specialization is of several kinds:
  - Vertical industry specialization such as Auxton in the telecommunications industry, CTG in banking and manufacturing, and Monchik-Weber (McGraw-Hill) in the finance industry. One objective is to take people with generic development skills and, by training and experience, transfer them into industry systems specialists. The effect is to transform a \$400 per day COBOL programmer into a \$1,000 per day banking system specialist or, more specifically, a loan management systems specialist.
  - Technical specialization into development or operational areas which are in demand. For example, specialization in networks such as Bolt Beranek and Newman, or artificial intelligence such as Teknowledge, or office systems such as Booz Allen.
- One emerging area of growth is commercial systems integration (SI). There have been large federal government SI contracts for many years with

companies such as CSC, EDS, TRW, and IBM. Recently, however, EDS in particular has been attacking and virtually creating a commercial market. In an SI contract, the contractor is responsible for the acquisition of all hardware, software, people, and communications necessary to accomplish the system objectives. These contracts can be very large indeed--the largest federal contract is \$11.4 billion for the implementation of the new FAA computer systems.

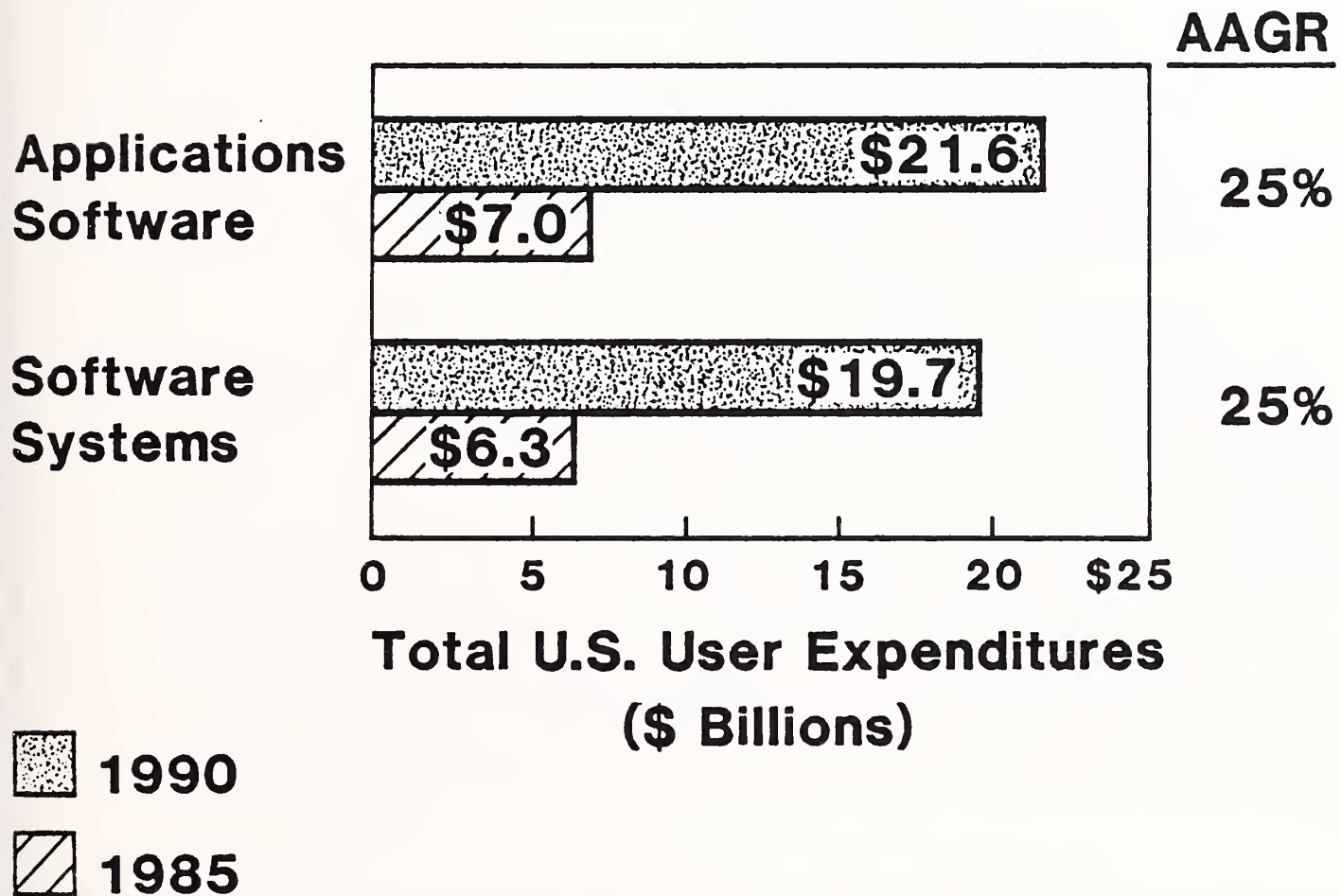
- In terms of basic demand, INPUT research shows that the major applications requirements in the industry today are primarily for the redevelopment of "gut-level" applications. The top ranking applications needs in some key industry areas are:
  - Banking - Demand Deposit Accounting.
  - Banking - Loan Applications.
  - Process Manufacturing - Finance and Accounting.
  - Process Manufacturing - Process Control.
  - Transportation - Finance.
  - Transportation - Office Systems.
- With this kind of demand and the tying down of most internal resources with the maintenance of existing applications, the growth of professional services could be explosive. The new applications area of "office systems" could contribute substantially to this growth.
- It is noteworthy that public professional services companies are the only group in this industry to have accelerated their growth rate over the last 18 months.

#### D. SOFTWARE PRODUCTS MARKET

- The "bloom is off the rose" as far as software products are concerned in 1985. However, INPUT expects the growth of this industry sector to recover for the remainder of the decade. As shown in Exhibit II-5, growth rates of 25% are forecast for both systems and applications software through 1990.
- In 1985, growth of the market slowed dramatically from 39% in 1984 to 20% in 1985. This slowdown was caused by a variety of factors, foremost of which was the industry's overall slowdown. The number of computers bought as information center systems in 1985 declined from 1984; each such system typically had \$200,000 to \$400,000 of software from independent companies associated with it. Since the new computers were not installed, the new software was not bought.
- In the microcomputer area, as INPUT predicted, there were fewer business systems sold in 1985 than in 1984. Consequently, the software associated with "new installs" did not grow as rapidly. Compounding the problem was extensive discounting represented by the "bundling" of products, straight discounts, and the emergence of less expensive compatible products. Much of the micro software, such as word processors, spreadsheet systems, and simple data base systems, is becoming "commodity" software. Borland is a prime example of this trend.
- Price discounts were not limited in 1985 to micro-oriented software. There was heavy discounting in the mainframe/minicomputer software business. This was not represented by official policies or changes in list prices. These were discounts, really price cuts, offered in the field in order to make sales. Many sales managers confronted by a slowing industry frantically pushed salespeople to "make deals." Unfortunately, this resulted in unnecessarily lower revenues and profits because price was rarely the issue that was slowing the process down or which could result in a decision.



## SOFTWARE PRODUCTS MARKETS



- Another reason for the slowdown in the software products market, particularly the applications area, was the problems vendors had, and are still having, with meeting design criteria and delivery schedules, not to mention in some cases, with making the software function at all. Hogan Systems and Walker Interactive are the most public examples, but the problem is widespread. One consequence of the well-publicized failures was a concern on the buyer's side with all similar products, resulting in delays in procurements from all vendors, not only the vendor with problems.
- Even with products properly priced and delivered by a vendor, the digestion or absorption of those products in 1985 had a slowing effect in itself. Buyers can only absorb so many new things at once.
- The reduction from the 33% forecast in 1984 for the average annual growth rate from 1984 to 1989 to the 25% forecast in 1985 for the 1985 to 1990 period is due to a number of factors.
  - The most important are the logistics and natural laws governing the industry through the late 1980s. The existing sales, distribution, and implementation channels can only absorb so much product. After all, "growing" a \$40 billion software product market 25% represents \$10 billion more to be sold in one year. INPUT does not believe this is feasible.
  - Another factor which serves to reduce the forecast market growth is the drive toward recurring revenues. Vendors are trying to even out their revenue flows so that they can more effectively manage their business. In the short term, however, this means that a \$300,000 "sale" may be replaced by a \$100,000 per year "lease."
- When considering the growth rates in the applications and systems software areas, the role of the computer manufacturers becomes important. The

systems software growth rate is much more secure than the applications software growth rate. As demonstrated last year, IBM not only introduced new systems software products, it also substantially increased the prices of its software. IBM and other manufacturers will continue these actions--new products and increased prices. Increased prices will not necessarily come from increasing the list prices, but by charging for upgrades, acceleration, training tools, etc. associated with a given product; thus, the effective cost of the product to the user increases.

- In INPUT's opinion, IBM and other manufacturers will supply applications products in the forecast timeframe. Initially these will be in relatively high business volume areas such as banking and manufacturing mainline applications, but the process will then extend outward. Although an independent and not a manufacturer, Cullinet is a role model for this process.
- It is certainly true that the applications vendors are more protected from the manufacturers than the systems software companies, but there are pressures on the manufacturers to move in this direction. The value-added in a system is increasingly in the application, hence the distribution of cost to the user will follow. Also, independent vendors are having difficulty with developing the new software required in the increasingly complex operating environment. User groups are going to the manufacturers, particularly IBM, asking for the development of products they can share. Thus, user demand, the cost of development, and the system cost distribution will all push manufacturers in this direction.
- Opposing the growth of the applications software product market is the trend to make software development easier. The use of software development methods and tools which make the process more efficient and effective allow users to develop custom solutions themselves or through professional services companies. However, INPUT considers that the process may be able to be improved by 20% per year, but that the complexity and development requirements are growing more rapidly at the moment.

- In the 1990s, the development process will become more the assembly of software and systems from pre-established modules using very high-level "languages" or integrating software.
- In the micro software area, there will be strong growth as represented in Exhibit II-6. This growth is based on about a 20% growth per year in numbers of business systems installed, including replacements. The software market will move rapidly because of applications and systems software additions and replacements in the installed base added to the software associated with "new installs." Commodity pricing and site licensing will depress the growth rate, which must be regarded as highly volatile. Cross-industry applications will be particularly affected.
- Overall, the software product market will be very different in 1990 from today. There will be more manufacturer control, electronic distribution, subscription software, innovative pricing, and recurring revenues than in 1985.

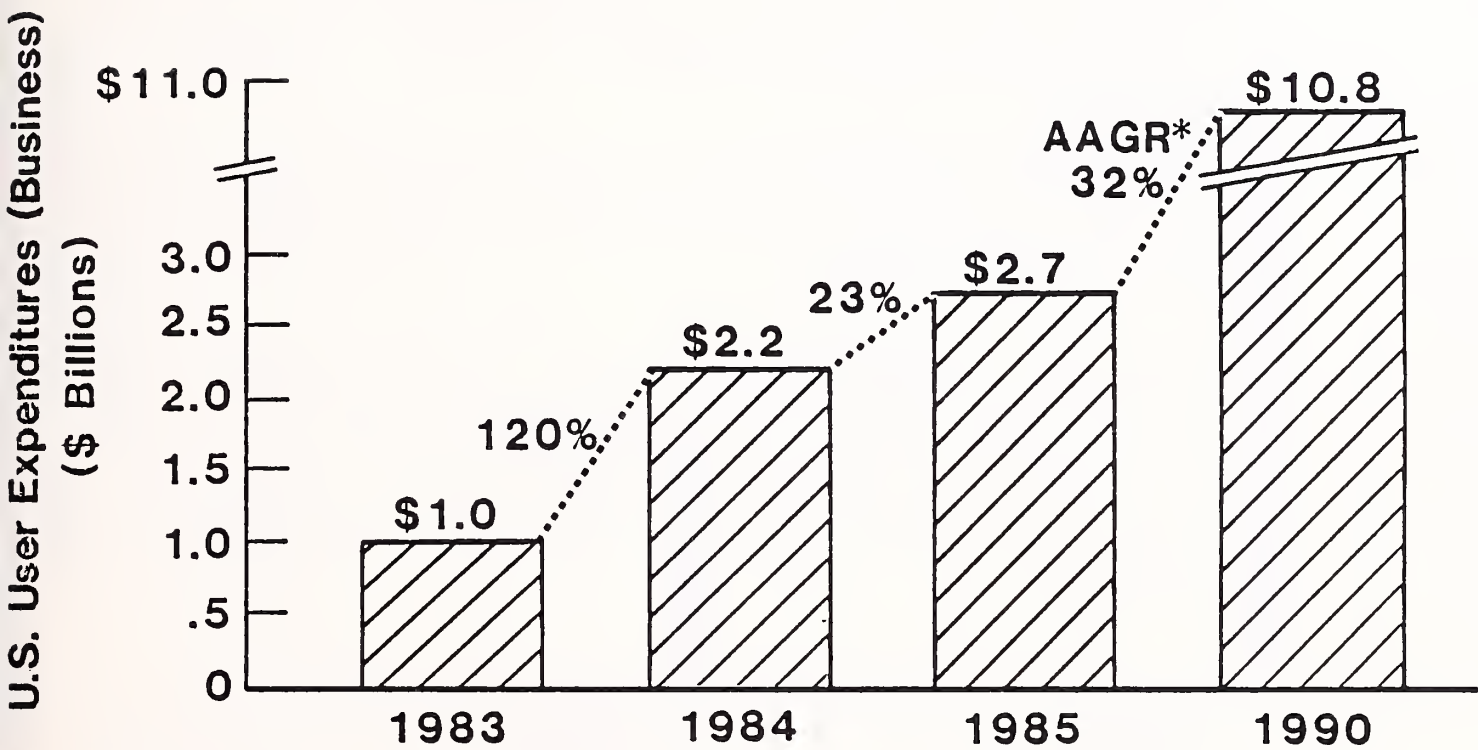
#### E. TURNKEY SYSTEMS MARKET

- In 1985, turnkey systems companies fared very poorly overall (industry growth dropped from over 30% to 14%). INPUT continues to believe that the customer interest in hardware/software integrated solutions on a packaged basis is very high. However, the current distribution mechanism is flawed in several respects which have contributed to the rapid reduction in industry growth in 1985.
- The two problems with turnkey systems companies are:
  - They do not charge enough for the "value added" above the hardware cost.



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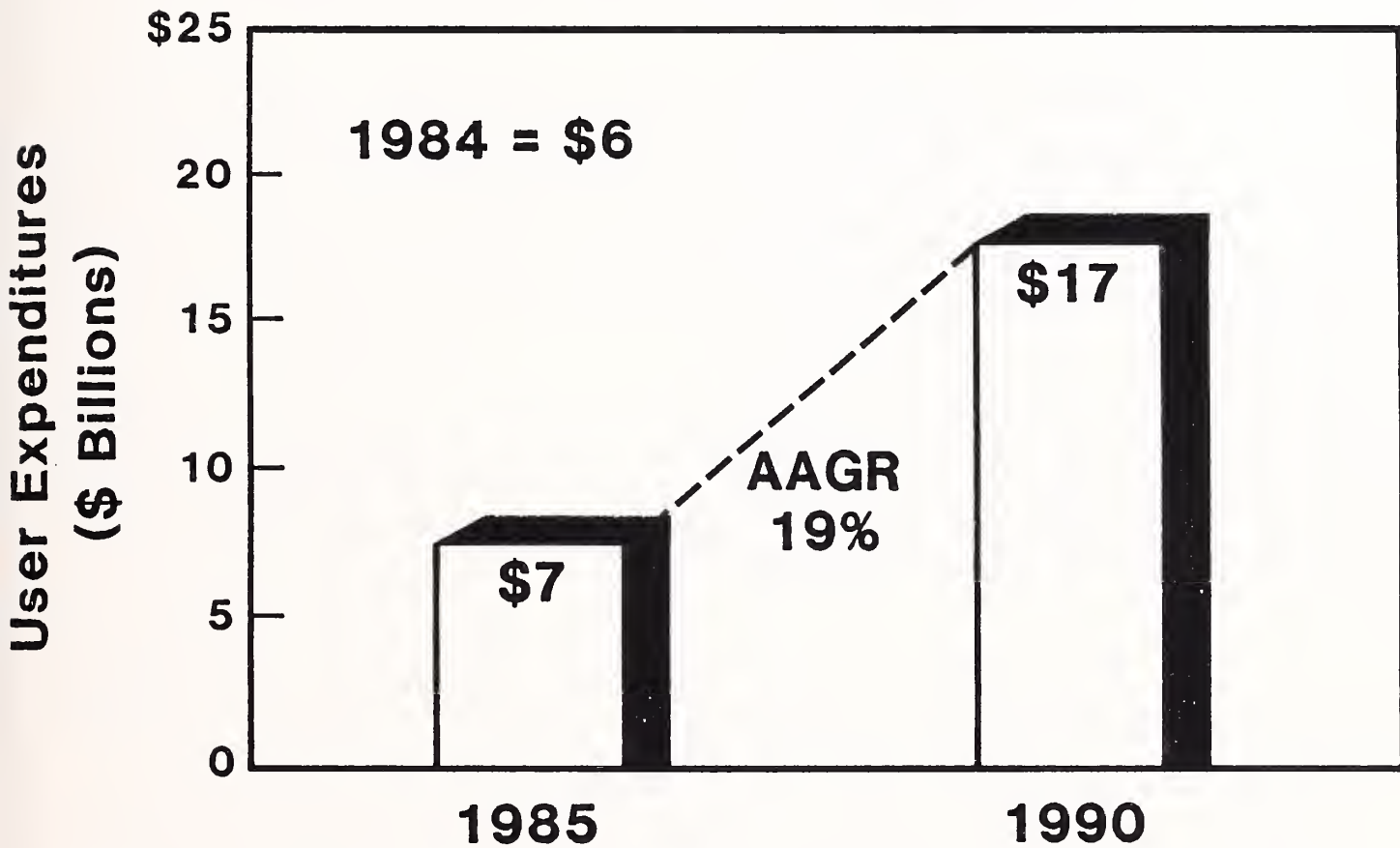
## MICROCOMPUTER MARKET TO SHOW HEALTHY FIVE-YEAR GROWTH



\*Average Annual Growth Rate

- They do not have sufficient recurring revenues, so they are highly vulnerable in any kind of slowdown.
- The first problem not only means that turnkey systems are inherently unprofitable, but also that they have no flexibility in pricing and are highly vulnerable to hardware manufacturers' actions.
- Over the next five years, INPUT expects that the average annual growth rate will be 19%, as shown in Exhibit II-7, as contrasted with 27% forecast last year. Reasons for the slower growth are:
  - Multi-year impact of the problems faced by many of these companies in 1985. For example, the drastic pruning of R&D budgets will reduce the flow of new products.
  - Continuing price/performance pressures. For several years (1982-1984), turnkey systems companies were able to maintain price levels while the cost of hardware to them was declining. This fell apart in 1985 and their price reduction (on the street as well as list) will continue.
  - As with software products, turnkey vendors are desperately trying to move their revenue base to recurring revenues. This will dampen the market growth rate, as explained in the software products discussion.
- INPUT believes there is a real question as to the viability of the value-added reseller (VAR) concept. Few of these companies appear to be profitable--there is high turnover and the benefit to the manufacturers may be short-term and questionable.
  - One fundamental problem is that the VARs do not charge enough for the "value added." Typically, hardware costs to the VAR are of the



INPUT<sup>®</sup>**TURNKEY SYSTEMS MARKET**

order of 40% of the delivered sale price. INPUT considers that they need to be about 20% in order to have sufficient margin for sales, support, marketing, software development, integration, operations, and profit.

- The second fundamental problem is that unlike most turnkey vendors, the VARs do not add enough value, making it very difficult to achieve a profit margin.
  - However, if a VAR does achieve that margin, it is almost immediately attacked by head-on-head competitors who offer the product at a substantial price reduction. INPUT research has shown it is very difficult to retain price differentials of more than 25% in comparable products.
  - This problem is exacerbated by the manufacturers who do not support exclusivity and indeed seem to actively work against it. This is probably because they wish to keep the VARs under control. "Divide and conquer" seems to be the spirit.
  - The problem is that the failure of VARs damages the manufacturer's reputation in the user community.
  - The only VARs that seem successful as a group in terms of profit and stability are those which have associated services. For these companies, a turnkey system (through a VAR relationship or otherwise) is simply another vehicle to deliver a solution, and because of strong customer relationships, profit margin and recurring revenue goals can be attained.
- In the turnkey market, the use of standard hardware from vendors such as IBM is the basis for most products. However, INPUT believes there is a real case to be made for customer hardware-based systems.

- The immediate reaction of most services companies to this concept is rejection--"I don't want to be in the manufacturing business" is the response. This fails to recognize that to be in the custom hardware business a company does not have to be a manufacturer. Apple Computer was not a manufacturer during its rapid growth years; it was not even an assembler. Apple contracted the assembly of product. IBM did the same for the most part with its PC initially.
- The "custom hardware" can actually be almost the same if not identical to the product from the computer manufacturer. Indeed you can buy the boards that the computer manufacturer uses in some cases. Intergraph is buying DEC VAX boards for a few thousand dollars and assembling them into its own "boxes" versus paying over \$100,000 for a VAX computer.
- Maintenance is not a problem in that user self-maintenance, remote diagnostics, depot maintenance, and other techniques can be used, not to mention the availability of third-party maintenance (TPM) organizations.
- Inventory, of course, can be a problem. Volume is necessary to keep the cost of the custom systems at the appropriate level. A strategy could be to build volume with low margin using the manufacturer's standard product, then move to a "plug compatible" custom system as an option to the buyer with a substantial price advantage.
- The advantage of this process is that it reduces the hardware component to the level at which appropriate profits can be made.
- The key to the use of custom hardware is that it can operate the standard manufacturer's software. In other words, it must be plug compatible or, ideally, based on the manufacturer's own subassemblies.

- Of course, this whole discussion shows the vulnerability of the manufacturers because of the potential for rapid price erosion of their products.

## F. CONCLUSION

- The whole information industry has become much more volatile. It has gone beyond its embryonic and early growth stages and is reaching maturity. Thus, the industry is increasingly subject to variability in economic conditions. It is still true that information services are growing far more rapidly than the economy as a whole, but this will start to change in the 1990s. At the moment, we see transference of cost from computer hardware to software and service which is driving the market, but this process will run its course by the early 1990s.
- In this extremely volatile and increasingly competitive environment it is vital to plan. Many companies failed dismally to deal with the issues raised in 1985 because they were not planning oriented--they were still technology and/or sales driven. They could not respond to the basic market changes. It is essential that companies detect market and competitive changes and have a method of dealing with them. This is the planning process.
- Planning is a process, not a discrete event. Once-a-year regurgitation of a "plan" is archaic and ineffective. We are all familiar with the syndrome that the annual plan meets reality for the first month of its existence (often because the plan is only issued after the first month has passed) and rapidly diverges from reality (or, rather, vice versa) with every passing month. Plans must be continually reviewed--rolling 4-quarter, rolling 12-month, and similar systems need to be installed.

- This change in process also requires everybody to be a "planner." INPUT does not advocate massive growth in central planning (we would then have the failures associated with this concept). Neither must the process become so bogged down in detail that it becomes overly cumbersome. It simply requires regular, systematic review and integration of market, product, technical, and competitive information into plans starting at the smallest unit.
- Regular review implies weekly review of items affecting the next 6 to 12 months, and monthly review of items affecting the longer term with perhaps quarterly or semi-annual consolidation. This will allow change detection, identification, and qualified reaction in an organized (and profitable) manner.
- It is vital that information provided through central planning groups who are the supporters and operators of the process be accurate and consistent. INPUT will continue to support these goals.





### III DATA BASE



### III DATA BASE

- The following exhibits provide the industry forecasts for 1985. In addition to the forecasts by delivery mode, there are detailed forecasts by industry-specific and cross-industry market segmentations.

## EXHIBIT III-1

## INFORMATION SERVICES MARKET BY MARKET SEGMENT, 1985-1990

SEGMENTATION	(\$M) 1984	84-85 GROWTH	(\$M) 1985	(\$M) 1986	(\$M) 1987	(\$M) 1988	(\$M) 1989	(\$M) 1990	AAGR 85-90
INDUSTRY-SPECIFIC									
DISCRETE MANUFACTURING	2573	17%	3023	3666	4458	5499	6682	7864	21%
PROCESS MANUFACTURING	1131	16%	1311	1571	1880	2265	2730	3215	20%
TRANSPORTATION	401	17%	471	581	736	937	1210	1576	27%
UTILITIES	190	11%	211	240	279	322	372	434	16%
TELECOMMUNICATIONS	508	19%	604	732	886	1068	1285	1545	21%
DISTRIBUTION	1358	16%	1579	1905	2323	2875	3551	4355	22%
BANKING AND FINANCE	4126	19%	4892	5942	7240	8612	10275	12422	20%
INSURANCE	952	13%	1073	1257	1499	1785	2090	2445	18%
MEDICAL	1456	20%	1740	2129	2603	3202	3959	4931	23%
EDUCATION	191	16%	221	264	315	375	448	534	19%
SERVICES	1126	18%	1324	1626	1996	2447	2984	3672	23%
FEDERAL GOVERNMENT	565	20%	678	794	963	1151	1367	1647	19%
STATE AND LOCAL GOVERNMENT	412	16%	476	560	662	792	943	1130	19%
OTHER INDUSTRY-SPECIFIC	587	14%	669	788	959	1119	1347	1608	19%
SUB-TOTAL	15576	17%	18272	22055	26799	32449	39243	47378	21%
CROSS-INDUSTRY									
PLANNING AND ANALYSIS	1980	19%	2360	2872	3430	3997	4573	5118	17%
ACCOUNTING	2248	15%	2588	3053	3602	4154	4688	5253	15%
HUMAN RESOURCES	1383	13%	1561	1768	2021	2285	2573	2887	13%
ENGINEERING/SCIENTIFIC	1178	17%	1377	1640	1975	2368	2809	3327	19%
EDUCATION/TRAINING	242	21%	294	363	458	578	715	904	25%
ON-LINE DATA BASES	607	19%	722	896	1120	1399	1734	2152	24%
OTHER CROSS-INDUSTRY	1869	11%	2077	2413	2816	3261	3798	4325	16%
SUB-TOTAL	9507	15%	10979	13005	15422	18042	20890	23966	17%
OTHER									
PROFESSIONAL SERVICES	8856	19%	10529	12543	15098	18263	22081	26315	20%
UTILITY PROCESSING	1931	6%	2052	2210	2382	2543	2697	2869	7%
SYSTEMS SOFTWARE	5333	19%	6322	8013	10377	13158	16207	19651	25%
VANS	290	27%	368	467	595	762	982	1270	28%
GRAND TOTAL	41493	17%	48522	58293	70673	85217	102100	121449	20%



## EXHIBIT III-2

INFORMATION SERVICES MARKET  
BY DELIVERY MODE  
1985-1990

SEGMENTATION BY DELIVERY MODE	(\$M) 1984	84-85 GROWTH	(\$M) 1985	(\$M) 1986	(\$M) 1987	(\$M) 1988	(\$M) 1989	(\$M) 1990	ANNUAL 85-90
REMOTE COMPUTING/BATCH									
INDUSTRY SPECIFIC	6787	15%	7827	9211	10843	12709	14943	17512	17%
CROSS INDUSTRY	4254	14%	4852	5614	6542	7659	8953	10408	16%
UTILITY PROCESSING	1789	6%	1896	2029	2171	2301	2416	2537	6%
SUBTOTAL	12830	14%	14575	16854	19556	22669	26312	30457	16%
FACILITIES MANAGEMENT									
INDUSTRY SPECIFIC	1864	15%	2151	2488	2890	3363	3865	4436	16%
CROSS INDUSTRY	57	5%	60	62	63	64	67	71	3%
UTILITY PROCESSING	142	10%	156	181	211	242	281	332	16%
SUBTOTAL	2063	15%	2367	2731	3164	3669	4213	4839	15%
TOTAL PROCESSING/NETWORK SERV.									
INDUSTRY SPECIFIC	8651	15%	9978	11699	13733	16072	18800	21948	17%
CROSS INDUSTRY	4311	14%	4912	5676	6605	7723	9020	10479	16%
UTILITY PROCESSING	1931	6%	2052	2210	2382	2543	2697	2869	7%
VANS	290	27%	368	467	595	762	982	1270	28%
TOTAL	15183	14%	17310	20052	23315	27100	31507	36566	16%
SOFTWARE PRODUCTS									
MAINFRAME/MINICOMPUTER									
INDUSTRY SPECIFIC	2248	22%	2751	3637	4810	6123	7820	9750	29%
CROSS INDUSTRY	1948	17%	2275	2808	3414	3994	4518	5087	17%
SUBTOTAL	4196	19%	5026	6445	8224	10117	12338	14837	23%
MICROCOMPUTER									
INDUSTRY SPECIFIC	352	34%	473	782	1049	1530	2125	3034	45%
CROSS INDUSTRY	1193	23%	1465	1868	2340	2786	3217	3679	20%
SUBTOTAL	1545	23%	1938	2570	3389	4316	5342	6713	32%
TOTAL APPLICATIONS SOFTWARE	5741	21%	6964	9015	11613	14433	17680	21550	25%
SYSTEMS SOFTWARE									
MAINFRAME/MINICOMPUTER	4685	19%	5569	7034	8985	11124	13284	15540	23%
MICROCOMPUTER	648	16%	753	979	1392	2034	2923	4111	40%
TOTAL SYSTEMS SOFTWARE	5333	19%	6322	8013	10377	13158	16207	19651	25%
TOTAL SOFTWARE	11074	20%	13286	17028	21990	27591	33887	41201	25%
PROFESSIONAL SERVICES									
SOFTWARE DEVELOPMENT	5307	17%	6233	7327	8723	10546	12817	15253	20%
CONSULTING	1425	20%	1717	2089	2542	3055	3676	4351	20%
EDUCATION	834	26%	1049	1329	1708	2173	2691	3352	26%
FACILITIES MANAGEMENT	668	11%	730	814	905	1000	1096	1197	10%
SYSTEMS INTEGRATION-FED	630	27%	800	984	1220	1489	1801	2162	22%
TOTAL PROFESSIONAL SERVICES	8656	19%	10529	12543	15090	18263	22001	26315	20%
TURNKEY SYSTEMS									
INDUSTRY SPECIFIC	4325	17%	5070	6017	7207	8724	10490	12646	20%
CROSS INDUSTRY	2055	13%	2327	2653	3063	3539	4135	4721	15%
TOTAL TURNKEY SYSTEMS	6380	16%	7397	8670	10270	12263	14625	17367	19%
GRAND TOTAL	41493	17%	48522	58293	70673	85217	102100	121449	20%

## EXHIBIT III-3

## PROCESSING/NETWORK SERVICES MARKET BY MARKET SEGMENT, 1985-1990

SEGMENTATION	(\$M) 1984	84-85 GROWTH	(\$M) 1985	(\$M) 1986	(\$M) 1987	(\$M) 1988	(\$M) 1989	(\$M) 1990	AAGR 85-90
INDUSTRY-SPECIFIC									
DISCRETE MANUFACTURING	707	17%	825	977	1162	1393	1669	1934	19%
PROCESS MANUFACTURING	706	15%	811	955	1114	1306	1530	1708	16%
TRANSPORTATION	190	14%	216	248	293	348	421	508	19%
UTILITIES	132	10%	145	161	180	200	222	245	11%
TELECOMMUNICATIONS	304	18%	358	425	501	587	682	785	17%
DISTRIBUTION	725	13%	820	953	1118	1335	1605	1874	18%
BANKING AND FINANCE	2816	18%	3309	3921	4628	5428	6316	7483	18%
INSURANCE	566	10%	623	694	780	879	987	1122	12%
MEDICAL	807	15%	928	1087	1265	1464	1705	1993	17%
EDUCATION	67	7%	72	79	86	95	104	114	10%
SERVICES	739	16%	859	1027	1210	1418	1647	1912	17%
FEDERAL GOVERNMENT	136	14%	155	181	219	258	304	362	18%
STATE AND LOCAL GOVERNMENT	308	15%	355	414	486	579	686	819	18%
OTHER INDUSTRY-SPECIFIC	448	12%	502	577	691	782	930	1089	17%
SUB-TOTAL	8651	15%	9978	11699	13733	16072	18808	21948	17%
CROSS-INDUSTRY									
PLANNING AND ANALYSIS	725	14%	829	957	1107	1281	1464	1626	14%
ACCOUNTING	922	12%	1033	1167	1330	1530	1775	2058	15%
HUMAN RESOURCES	799	12%	893	992	1111	1252	1420	1598	12%
ENGINEERING/SCIENTIFIC	790	16%	915	1084	1285	1524	1798	2116	18%
EDUCATION/TRAINING	79	11%	88	98	110	122	134	148	11%
ON-LINE DATA BASES	607	19%	722	896	1120	1399	1734	2152	24%
OTHER CROSS-INDUSTRY	389	12%	432	482	542	615	695	781	14%
SUB-TOTAL	4311	14%	4912	5676	6605	7723	9020	10479	16%
OTHER									
UTILITY PROCESSING	1931	6%	2052	2210	2382	2543	2697	2869	7%
VALUE ADDED NETWORKS	290	27%	368	467	595	762	982	1270	28%
GRAND TOTAL	15183	14%	17310	20052	23315	27100	31507	36566	16%

## EXHIBIT III-4

NETWORK/REMOTE COMPUTING/BATCH SERVICES MARKET  
BY MARKET SEGMENT, 1985-1990

SEGMENTATION	(\$M) 1984	84-85 GROWTH	(\$M) 1985	(\$M) 1986	(\$M) 1987	(\$M) 1988	(\$M) 1989	(\$M) 1990	AAGR 85-90
INDUSTRY-SPECIFIC SECTORS									
DISCRETE MANUFACTURING	669	17%	781	926	1103	1324	1590	1842	19%
PROCESS MANUFACTURING	666	15%	765	901	1050	1231	1442	1606	16%
TRANSPORTATION	165	15%	190	221	265	318	390	475	20%
UTILITIES	121	10%	133	148	165	184	204	226	11%
TELECOMMUNICATIONS	288	18%	340	404	477	558	648	745	17%
DISTRIBUTION	685	13%	773	898	1052	1256	1511	1765	18%
BANKING AND FINANCE	2061	17%	2411	2865	3388	3978	4656	5583	18%
INSURANCE	273	11%	304	339	383	430	485	564	13%
MEDICAL	523	15%	601	708	822	945	1103	1295	17%
EDUCATION	49	8%	53	59	65	73	81	90	11%
SERVICES	734	16%	853	1020	1202	1409	1637	1900	17%
FEDERAL GOVERNMENT	62	15%	71	84	106	127	152	186	21%
STATE AND LOCAL GOVERNMENT	51	16%	59	71	85	106	127	160	22%
OTHER INDUSTRY-SPECIFIC	440	12%	493	567	680	770	917	1075	17%
SUB-TOTAL	6787	15%	7827	9211	10843	12709	14943	17512	17%
CROSS-INDUSTRY SECTORS									
PLANNING AND ANALYSIS	725	14%	829	957	1107	1281	1464	1626	14%
ACCOUNTING	922	12%	1033	1167	1330	1530	1775	2058	15%
HUMAN RESOURCES	799	12%	893	992	1111	1252	1420	1598	12%
ENGINEERING/SCIENTIFIC	790	16%	915	1084	1285	1524	1798	2116	18%
EDUCATION/TRAINING	79	11%	88	98	110	122	134	148	11%
ON-LINE DATA BASES	607	19%	722	896	1120	1399	1734	2152	24%
OTHER CROSS-INDUSTRY	332	12%	372	420	479	551	628	710	14%
SUB-TOTAL	4254	14%	4852	5614	6542	7659	8953	10408	16%
OTHER SECTORS									
UTILITY PROCESSING	1789	6%	1896	2029	2171	2301	2416	2537	6%
VALUE ADDED NETWORKS	290	27%	368	467	595	762	982	1270	28%
TOTAL	13120	14%	14943	17321	20151	23431	27294	31727	16%

## EXHIBIT III-5

PROCESSING FACILITIES MANAGEMENT MARKET  
BY MARKET SEGMENT

1985-1990

SEGMENTATION	(\$M) 1984	84-85 GROWTH	(\$M) 1985	(\$M) 1986	(\$M) 1987	(\$M) 1988	(\$M) 1989	(\$M) 1990	AAGR 85-90
INDUSTRY-SPECIFIC									
DISCRETE MANUFACTURING	38	16%	44	51	59	69	79	92	16%
PROCESS MANUFACTURING	40	15%	46	54	64	75	88	102	17%
TRANSPORTATION	25	4%	26	27	28	30	31	33	5%
UTILITIES	11	9%	12	13	15	16	18	19	10%
TELECOMMUNICATIONS	16	13%	18	21	24	29	34	40	17%
DISTRIBUTION	40	18%	47	55	66	79	94	109	18%
BANKING AND FINANCE	755	19%	898	1056	1240	1450	1660	1900	16%
INSURANCE	293	9%	319	355	397	449	502	558	12%
MEDICAL	284	15%	327	379	443	519	602	698	16%
EDUCATION	18	6%	19	20	21	22	23	24	5%
SERVICES	5	20%	6	7	8	9	10	12	15%
FEDERAL GOVERNMENT	74	14%	84	97	113	131	152	176	16%
STATE AND LOCAL GOVERNMENT	257	15%	296	343	401	473	559	659	17%
OTHER INDUSTRY-SPECIFIC	8	13%	9	10	11	12	13	14	9%
SUB-TOTAL	1864	15%	2151	2488	2890	3363	3865	4436	16%
CROSS INDUSTRY TOTAL	57	5%	60	62	63	64	67	71	3%
UTILITY PROCESSING SECTOR	142	10%	156	181	211	242	281	332	16%
TOTAL	2063	15%	2367	2731	3164	3669	4213	4839	15%



## EXHIBIT III-6

ON-LINE DATA BASE SERVICES MARKET  
BY MARKET SEGMENT  
1985-1990

SEGMENTATION	(\$M) 1984	84-85 GROWTH	(\$M) 1985	(\$M) 1986	(\$M) 1987	(\$M) 1988	(\$M) 1989	(\$M) 1990	AAGR 85-90
INDUSTRY-SPECIFIC									
DISCRETE MANUFACTURING	173	28%	221	281	354	443	549	676	25%
PROCESS MANUFACTURING	55	18%	65	92	124	161	199	245	30%
TRANSPORTATION	59	15%	68	79	92	109	127	147	17%
UTILITIES	18	17%	21	24	29	34	39	46	17%
TELECOMMUNICATIONS	104	29%	134	170	215	268	333	409	25%
DISTRIBUTION	154	23%	189	235	296	370	459	564	24%
BANKING AND FINANCE	279	24%	346	429	541	676	838	1031	24%
INSURANCE	42	29%	54	69	87	108	134	165	25%
MEDICAL	20	15%	23	27	31	37	43	50	17%
EDUCATION	19	11%	21	24	28	33	39	45	16%
SERVICES	192	20%	230	323	435	566	702	863	30%
FEDERAL GOVERNMENT	19	21%	23	29	36	45	56	69	25%
STATE AND LOCAL GOVERNMENT	6	17%	7	9	12	15	18	22	26%
OTHER INDUSTRY-SPECIFIC	43	21%	52	65	81	102	126	155	24%
SUB-TOTAL	1183	23%	1454	1856	2361	2967	3662	4487	25%
CROSS INDUSTRY									
SECURITIES	124	24%	154	195	252	322	409	528	28%
CREDIT	192	23%	237	301	382	485	606	751	26%
TEXT/BIBLIOGRAPHY	73	12%	82	98	117	143	173	210	21%
NEWS	132	17%	154	191	239	296	364	452	24%
ECONOMIC/OTHER	86	10%	95	111	130	153	182	211	17%
SUB-TOTAL	607	19%	722	896	1120	1399	1734	2152	24%
TOTAL	1790	22%	2176	2752	3481	4366	5396	6639	25%



## EXHIBIT III-7

SOFTWARE PRODUCTS MARKET  
BY MARKET SEGMENT, 1985-1990

SEGMENTATION	(\$M) 1984	84-85 GROWTH	(\$M) 1985	(\$M) 1986	(\$M) 1987	(\$M) 1988	(\$M) 1989	(\$M) 1990	AAGR 85-90
APPLICATIONS SOFTWARE									
INDUSTRY-SPECIFIC									
DISCRETE MANUFACTURING	624	15%	717	897	1141	1451	1822	2120	24%
PROCESS MANUFACTURING	124	29%	160	228	324	451	620	852	40%
TRANSPORTATION	102	29%	132	187	269	380	537	763	42%
UTILITIES	23	13%	26	33	44	56	70	91	28%
TELECOMMUNICATIONS	35	34%	47	70	100	139	190	260	41%
DISTRIBUTION	272	24%	337	458	622	840	1099	1440	34%
BANKING AND FINANCE	750	25%	939	1268	1715	2117	2700	3466	30%
INSURANCE	241	19%	286	370	489	625	761	912	26%
MEDICAL	204	45%	296	438	625	897	1262	1757	43%
EDUCATION	47	23%	58	78	102	131	165	205	29%
SERVICES	84	31%	110	156	219	297	386	504	36%
FEDERAL GOVERNMENT	17	18%	20	25	32	39	47	55	22%
STATE AND LOCAL GOVERNMENT	24	17%	28	36	46	57	69	84	25%
OTHER INDUSTRY-SPECIFIC	53	28%	68	95	131	173	217	275	32%
SUB-TOTAL	2600	24%	3224	4339	5859	7653	9945	12784	32%
CROSS-INDUSTRY									
PLANNING AND ANALYSIS	1045	23%	1289	1634	1991	2296	2599	2890	18%
ACCOUNTING	1001	18%	1179	1473	1813	2124	2368	2605	17%
HUMAN RESOURCES	397	13%	450	534	625	706	780	875	14%
ENGINEERING/SCIENTIFIC	153	19%	182	234	300	379	459	561	25%
EDUCATION/TRAINING	60	40%	84	125	186	269	376	521	44%
OTHER CROSS-INDUSTRY	485	15%	556	676	839	1006	1153	1314	19%
SUB-TOTAL	3141	19%	3740	4676	5754	6780	7735	8766	19%
TOTAL APPLICATIONS SOFTWARE	5741	21%	6964	9015	11613	14433	17680	21550	25%
SYSTEMS SOFTWARE									
APPLICATION DEVELOPMENT	2272	23%	2785	3654	4909	6412	8160	10311	30%
SYSTEMS CONTROL	1837	16%	2137	2662	3391	4256	5187	6102	23%
DATA CENTER MANAGEMENT	1224	14%	1400	1697	2077	2490	2860	3238	18%
TOTAL SYSTEMS SOFTWARE	5333	19%	6322	8013	10377	13158	16207	19651	25%
GRAND TOTAL	11074	20%	13286	17028	21990	27591	33887	41201	25%

## EXHIBIT III-8

MINI/MAINFRAME COMPUTER SOFTWARE PRODUCTS MARKET  
BY MARKET SEGMENT, 1985-1990

SEGMENTATION	(\$M) 1984	84-85 GROWTH	(\$M) 1985	(\$M) 1986	(\$M) 1987	(\$M) 1988	(\$M) 1989	(\$M) 1990	AAGR 85-90
INDUSTRY-SPECIFIC									
DISCRETE MANUFACTURING	586	13%	661	806	984	1210	1491	1644	20%
PROCESS MANUFACTURING	96	27%	122	170	236	322	432	577	36%
TRANSPORTATION	87	28%	111	156	222	309	432	608	41%
UTILITIES	20	10%	22	27	34	42	49	59	22%
TELECOMMUNICATIONS	30	33%	40	59	84	114	154	208	39%
DISTRIBUTION	215	22%	262	348	461	601	777	999	31%
BANKING AND FINANCE	674	25%	845	1140	1539	1883	2379	2989	29%
INSURANCE	195	17%	228	288	374	465	550	630	23%
MEDICAL	174	45%	252	366	512	717	997	1365	40%
EDUCATION	15	13%	17	22	27	33	39	44	21%
SERVICES	69	25%	86	115	153	195	238	287	27%
FEDERAL GOVERNMENT	14	14%	16	20	25	30	36	41	21%
STATE AND LOCAL GOVERNMENT	23	13%	26	33	41	49	56	64	20%
OTHER INDUSTRY-SPECIFIC	50	26%	63	87	118	153	190	235	30%
SUB-TOTAL	2248	22%	2751	3637	4810	6123	7820	9750	29%
CROSS-INDUSTRY									
PLANNING AND ANALYSIS	481	25%	603	787	992	1196	1401	1596	21%
ACCOUNTING	806	13%	912	1098	1307	1489	1631	1785	14%
HUMAN RESOURCES	362	13%	410	485	563	630	690	768	13%
ENGINEERING/SCIENTIFIC	127	18%	150	191	242	302	361	436	24%
EDUCATION/TRAINING	22	36%	30	43	61	83	108	138	36%
OTHER CROSS-INDUSTRY	150	13%	170	204	249	294	327	364	16%
SUB-TOTAL	1948	17%	2275	2808	3414	3994	4518	5087	17%
TOTAL APPLICATIONS SOFTWARE	4196	20%	5026	6445	8224	10117	12338	14837	24%
SYSTEMS SOFTWARE									
APPLICATION DEV TOOLS	1944	23%	2383	3108	4112	5263	6496	7917	27%
SYSTEMS CONTROL	1527	18%	1800	2252	2836	3440	4055	4613	21%
DATA CENTER MANAGEMNET	1214	14%	1386	1674	2037	2421	2733	3010	17%
SUB-TOTAL	4685	19%	5569	7034	8985	11124	13284	15540	23%
GRAND TOTAL	8881	19%	10595	13479	17209	21241	25622	30377	23%

## EXHIBIT III-9

MICROCOMPUTER SOFTWARE PRODUCTS MARKET  
BY MARKET SEGMENT, 1985-1990

SEGMENTATION	(\$M) 1984	84-85 GROWTH	(\$M) 1985	(\$M) 1986	(\$M) 1987	(\$M) 1988	(\$M) 1989	(\$M) 1990	AAGR 85-90
INDUSTRY-SPECIFIC									
DISCRETE MANUFACTURING	38	47%	56	91	157	241	331	476	53%
PROCESS MANUFACTURING	28	36%	38	58	88	129	188	275	49%
TRANSPORTATION	15	40%	21	31	47	71	105	155	49%
UTILITIES	3	33%	4	6	10	14	21	32	52%
TELECOMMUNICATIONS	5	40%	7	11	16	25	36	52	49%
DISTRIBUTION	57	32%	75	110	161	239	322	441	43%
BANKING AND FINANCE	76	24%	94	128	176	234	321	477	38%
INSURANCE	46	26%	58	82	115	160	211	282	37%
MEDICAL	30	47%	44	72	113	180	265	392	55%
EDUCATION	32	28%	41	56	75	98	126	161	31%
SERVICES	15	60%	24	41	66	102	148	217	55%
FEDERAL GOVERNMENT	3	33%	4	5	7	9	11	14	28%
STATE AND LOCAL GOVERNMENT	1	100%	2	3	5	8	13	20	58%
OTHER INDUSTRY-SPECIFIC	3	67%	5	8	13	20	27	40	52%
SUB-TOTAL	352	34%	473	702	1049	1530	2125	3034	45%
CROSS-INDUSTRY									
PLANNING AND ANALYSIS	564	22%	686	847	999	1100	1198	1294	14%
ACCOUNTING	195	37%	267	375	506	635	737	820	25%
HUMAN RESOURCES	35	14%	40	49	62	75	90	107	22%
ENGINEERING/SCIENTIFIC	26	23%	32	43	58	77	98	125	31%
EDUCATION/TRAINING	38	42%	54	82	125	186	268	383	48%
OTHER CROSS-INDUSTRY	335	15%	386	472	590	712	826	950	20%
SUB-TOTAL	1193	23%	1465	1868	2340	2786	3217	3679	20%
TOTAL APPLICATIONS SOFTWARE	1545	25%	1938	2570	3389	4316	5342	6713	28%
SYSTEMS SOFTWARE									
APPLICATION DEV TOOLS	328	23%	402	546	797	1149	1664	2394	43%
SYSTEMS CONTROL	310	9%	337	410	555	816	1132	1489	35%
DATA CENTER MANAGEMENT	10	40%	14	23	40	69	127	228	75%
SUB-TOTAL	648	16%	753	979	1392	2034	2923	4111	40%
GRAND TOTAL	2193	23%	2691	3549	4781	6350	8265	10824	32%

EXHIBIT III-10

SYSTEMS SOFTWARE PRODUCTS MARKET  
BY DELIVERY MODE  
1985-1990

SEGMENTATION BY DELIVERY MODE	(\$M) 1984	84-85 GROWTH	(\$M) 1985	(\$M) 1986	(\$M) 1987	(\$M) 1988	(\$M) 1989	(\$M) 1990	AAGR 85-90
APPLICATION DEVELOPMENT TOOLS									
MAINFRAME/MINI	1944	23%	2383	3108	4112	5263	6496	7917	27%
MICRO	328	23%	402	546	797	1149	1664	2394	43%
TOTAL APPLICATION DEV. TOOLS	2272	23%	2785	3654	4909	6412	8160	10311	30%
SYSTEMS CONTROL									
MAINFRAME/MINI	1527	18%	1800	2252	2836	3440	4055	4613	21%
MICRO	310	9%	337	410	555	816	1132	1489	35%
TOTAL SYSTEMS CONTROL	1837	16%	2137	2662	3391	4256	5187	6102	23%
DATA CENTER MANAGEMENT									
MAINFRAME/MINI	1214	14%	1386	1674	2037	2421	2733	3010	17%
MICRO	10	40%	14	23	40	69	127	228	75%
TOTAL DATA CENTER MANAGEMENT	1224	14%	1400	1697	2077	2490	2860	3238	18%
TOTAL MAINFRAME/MINI	4685	19%	5569	7034	8985	11124	13284	15540	23%
TOTAL MICROCOMPUTER	648	16%	753	979	1392	2034	2923	4111	40%
GRAND TOTAL	5333	19%	6322	8013	10377	13158	16207	19651	25%



## EXHIBIT III-11

TURNKEY SYSTEMS MARKET  
BY MARKET SEGMENT  
1985-1990

SEGMENTATION	(\$M) 1984	84-85 GROWTH	(\$M) 1985	(\$M) 1986	(\$M) 1987	(\$M) 1988	(\$M) 1989	(\$M) 1990	AAGR 85-90
INDUSTRY-SPECIFIC									
DISCRETE MANUFACTURING	1242	19%	1481	1792	2155	2655	3191	3810	21%
PROCESS MANUFACTURING	301	13%	340	388	442	508	580	655	14%
TRANSPORTATION	109	13%	123	146	174	209	252	305	20%
UTILITIES	35	14%	40	46	55	66	80	98	20%
TELECOMMUNICATIONS	169	18%	199	237	285	342	413	500	20%
DISTRIBUTION	361	17%	422	494	583	700	847	1041	20%
BANKING AND FINANCE	560	15%	644	753	897	1067	1259	1473	18%
INSURANCE	145	13%	164	193	230	281	342	411	20%
MEDICAL	445	16%	516	604	713	841	992	1181	18%
EDUCATION	77	18%	91	107	127	149	179	215	19%
SERVICES	303	17%	355	443	567	732	951	1256	29%
FEDERAL GOVERNMENT	412	22%	503	588	712	854	1016	1230	20%
STATE AND LOCAL GOVERNMENT	80	16%	93	110	130	156	188	227	20%
OTHER INDUSTRY-SPECIFIC	86	15%	99	116	137	164	200	244	20%
SUB-TOTAL	4325	17%	5070	6017	7207	8724	10490	12646	20%
CROSS INDUSTRY									
PLANNING AND ANALYSIS	210	15%	242	281	332	420	510	602	20%
ACCOUNTING	325	16%	376	413	459	500	545	590	9%
HUMAN RESOURCES	187	17%	218	242	285	327	373	414	14%
ENGINEERING/SCIENTIFIC	235	19%	280	322	390	465	552	650	18%
EDUCATION/TRAINING	103	18%	122	140	162	187	205	235	14%
OTHER CROSS-INDUSTRY	995	9%	1089	1255	1435	1640	1950	2230	15%
SUB-TOTAL	2055	13%	2327	2653	3063	3539	4135	4721	15%
GRAND TOTAL	6380	16%	7397	8670	10270	12263	14625	17367	19%

## EXHIBIT III-12

PROFESSIONAL SERVICES MARKET  
BY INDUSTRY  
1985-1990

SEGMENTATION	(\$M) 1984	84-85 GROWTH	(\$M) 1985	(\$M) 1986	(\$M) 1987	(\$M) 1988	(\$M) 1989	(\$M) 1990	AAGR 85-90
INDUSTRY-SPECIFIC									
DISCRETE MANUFACTURING	1401	20%	1681	2034	2522	3103	3816	4579	22%
PROCESS MANUFACTURING	670	18%	791	941	1138	1400	1736	2101	22%
TRANSPORTATION	122	12%	137	157	184	215	256	305	17%
UTILITIES	61	10%	67	74	83	90	96	103	9%
TELECOMMUNICATIONS	244	25%	305	387	492	625	787	968	26%
DISTRIBUTION	426	14%	486	558	648	764	910	1064	17%
BANKING AND FINANCE	✓ 1036	21%	1254	1529	1881	2314	2869	3500	23%
INSURANCE	609	16%	706	834	992	1210	1476	1757	20%
MEDICAL	183	20%	220	266	324	399	494	598	22%
EDUCATION	61	7%	65	70	77	84	92	101	9%
SERVICES	122	15%	140	163	189	219	258	302	17%
FEDERAL GOVERNMENT	2763	21%	3346	3972	4729	5633	6647	7844	19%
STATE AND LOCAL GOVERNMENT	975	15%	1121	1312	1548	1858	2229	2608	18%
OTHER INDUSTRY-SPECIFIC	183	15%	210	246	291	349	415	485	18%
TOTAL	8856	19%	10529	12543	15098	18263	22081	26315	20%



## EXHIBIT III-13

PROFESSIONAL SERVICES MARKET  
BY TYPE OF SERVICE  
1985-1990

FEDERAL GOVERNMENT SEGMENTATION	(\$M) 1984	84-85 GROWTH	(\$M) 1985	(\$M) 1986	(\$M) 1987	(\$M) 1988	(\$M) 1989	(\$M) 1990	AAGR 85-90
PROFESSIONAL SERVICES									
SOFTWARE DEVELOPMENT	1098	24%	1362	1647	1928	2313	2729	3248	19%
CONSULTING	292	18%	345	385	459	533	629	717	16%
EDUCATION & TRAINING	234	17%	274	323	420	525	646	807	24%
FACILITIES MANAGEMENT	509	11%	565	633	702	773	842	910	10%
SYSTEMS INTEGRATION	630	27%	800	984	1220	1489	1801	2162	22%
SUB-TOTAL	2763	21%	3346	3972	4729	5633	6647	7844	19%
COMMERCIAL SEGMENTATION	(\$M) 1984	84-85 GROWTH	(\$M) 1985	(\$M) 1986	(\$M) 1987	(\$M) 1988	(\$M) 1989	(\$M) 1990	AAGR 85-90
PROFESSIONAL SERVICES									
SOFTWARE DEVELOPMENT	4209	16%	4871	5680	6795	8233	10088	12005	20%
CONSULTING	1133	21%	1372	1704	2083	2522	3047	3634	22%
EDUCATION & TRAINING	600	29%	775	1006	1288	1648	2045	2545	27%
FACILITIES MANAGEMENT	151	9%	165	181	203	227	254	287	12%
SUB-TOTAL	6093	18%	7183	8571	10369	12630	15434	18471	21%
GRAND TOTAL	8856	19%	10529	12543	15098	18263	22081	26315	20%

EXHIBIT III-14

INDUSTRY-SPECIFIC SERVICES MARKET  
DISCRETE MANUFACTURING INDUSTRY SECTOR  
1985-1990

SEGMENTATION BY DELIVERY MODE	(\$M) 1984	84-85 GROWTH	(\$M) 1985	(\$M) 1986	(\$M) 1987	(\$M) 1988	(\$M) 1989	(\$M) 1990	AAGR 85-90
PROCESSING SERVICES									
REMOTE COMP/BATCH	669	17%	781	926	1103	1324	1590	1842	19%
FACILITY MANAGEMENT	38	16%	44	51	59	69	79	92	16%
TOTAL PROCESSING SERVICES	707	17%	825	977	1162	1393	1669	1934	19%
APPLICATION SOFTWARE									
MAINFRAME/MINI	586	13%	661	806	984	1210	1491	1644	20%
MICRO	38	47%	56	91	157	241	331	476	53%
TOTAL APPLICATION SOFTWARE	624	15%	717	897	1141	1451	1822	2120	24%
TURNKEY SYSTEMS	1242	19%	1481	1792	2155	2655	3191	3810	21%
TOTAL	2573	17%	3023	3666	4458	5499	6682	7864	21%

EXHIBIT III-15

INDUSTRY-SPECIFIC SERVICES MARKET  
PROCESS MANUFACTURING INDUSTRY SECTOR  
1985-1990

SEGMENTATION BY DELIVERY MODE	(\$M) 1984	84-85 GROWTH	(\$M) 1985	(\$M) 1986	(\$M) 1987	(\$M) 1988	(\$M) 1989	(\$M) 1990	AAGR 85-90
PROCESSING SERVICES									
REMOTE COMP/BATCH	666	15%	765	901	1050	1231	1442	1606	16%
FACILITY MANAGEMENT	40	15%	46	54	64	75	88	102	17%
TOTAL PROCESSING SERVICES	706	15%	811	955	1114	1306	1530	1708	16%
APPLICATION SOFTWARE									
MAINFRAME/MINI	96	27%	122	170	236	322	432	577	36%
MICRO	28	36%	38	58	88	129	188	275	49%
TOTAL APPLICATION SOFTWARE	124	29%	160	228	324	451	620	852	40%
TURNKEY SYSTEMS	301	13%	340	388	442	508	580	655	14%
TOTAL	1131	16%	1311	1571	1880	2265	2730	3215	20%

## EXHIBIT III-16

INDUSTRY-SPECIFIC SERVICES MARKET  
TRANSPORTATION INDUSTRY SECTOR  
1985-1990

SEGMENTATION BY DELIVERY MODE	(\$M) 1984	84-85 GROWTH	(\$M) 1985	(\$M) 1986	(\$M) 1987	(\$M) 1988	(\$M) 1989	(\$M) 1990	AAGR 85-90
PROCESSING SERVICES									
REMOTE COMP/BATCH	165	15%	190	221	265	318	390	475	20%
FACILITY MANAGEMENT	25	4%	26	27	28	30	31	33	5%
TOTAL PROCESSING SERVICES	190	14%	216	248	293	348	421	508	19%
APPLICATION SOFTWARE									
MAINFRAME/MINI	87	28%	111	156	222	309	432	608	41%
MICRO	15	40%	21	31	47	71	105	155	49%
TOTAL APPLICATION SOFTWARE	102	29%	132	187	269	380	537	763	42%
TURNKEY SYSTEMS	109	13%	123	146	174	209	252	305	20%
TOTAL	401	17%	471	581	736	937	1210	1576	27%

## EXHIBIT III-17

INDUSTRY-SPECIFIC SERVICES MARKET  
UTILITIES INDUSTRY SECTOR  
1985-1990

SEGMENTATION BY DELIVERY MODE	(\$M) 1984	84-85 GROWTH	(\$M) 1985	(\$M) 1986	(\$M) 1987	(\$M) 1988	(\$M) 1989	(\$M) 1990	AAGR 85-90
PROCESSING SERVICES									
REMOTE COMP/BATCH	121	10%	133	148	165	184	204	226	11%
FACILITY MANAGEMENT	11	9%	12	13	15	16	18	19	10%
TOTAL PROCESSING SERVICES	132	10%	145	161	180	200	222	245	11%
APPLICATION SOFTWARE									
MAINFRAME/MINI	20	10%	22	27	34	42	49	59	22%
MICRO	3	33%	4	6	10	14	21	32	52%
TOTAL APPLICATION SOFTWARE	23	13%	26	33	44	56	70	91	28%
TURNKEY SYSTEMS	35	14%	40	46	55	66	80	98	20%
TOTAL	190	11%	211	240	279	322	372	434	16%

## EXHIBIT III-18

INDUSTRY-SPECIFIC SERVICES MARKET  
TELECOMMUNICATIONS INDUSTRY SECTOR  
1985-1990

SEGMENTATION BY DELIVERY MODE	(\$M) 1984	84-85 GROWTH	(\$M) 1985	(\$M) 1986	(\$M) 1987	(\$M) 1988	(\$M) 1989	(\$M) 1990	AAGR 85-90
PROCESSING SERVICES									
REMOTE COMP/BATCH	288	18%	340	404	477	558	648	745	17%
FACILITY MANAGEMENT	16	13%	18	21	24	29	34	40	17%
TOTAL PROCESSING SERVICES	304	18%	358	425	501	587	682	785	17%
APPLICATION SOFTWARE									
MAINFRAME/MINI	30	33%	40	59	84	114	154	208	39%
MICRO	5	40%	7	11	16	25	36	52	49%
TOTAL APPLICATION SOFTWARE	35	34%	47	70	100	139	190	260	41%
TURNKEY SYSTEMS	169	18%	199	237	285	342	413	500	20%
TOTAL	508	19%	604	732	886	1068	1285	1545	21%



## EXHIBIT III-19

INDUSTRY-SPECIFIC SERVICES MARKET  
DISTRIBUTION INDUSTRY SECTOR  
1985-1990

SEGMENTATION BY DELIVERY MODE	(\$M) 1984	84-85 GROWTH	(\$M) 1985	(\$M) 1986	(\$M) 1987	(\$M) 1988	(\$M) 1989	(\$M) 1990	AAGR 85-90
PROCESSING SERVICES									
REMOTE COMP/BATCH	685	13%	773	898	1052	1256	1511	1765	18%
FACILITY MANAGEMENT	40	18%	47	55	66	79	94	109	18%
TOTAL PROCESSING SERVICES	725	13%	820	953	1118	1335	1605	1874	18%
APPLICATION SOFTWARE									
MAINFRAME/MINI	215	22%	262	348	461	601	777	999	31%
MICRO	57	32%	75	110	161	239	322	441	43%
TOTAL APPLICATION SOFTWARE	272	24%	337	458	622	840	1099	1440	34%
TURNKEY SYSTEMS	361	17%	422	494	583	700	847	1041	20%
TOTAL	1358	16%	1579	1905	2323	2875	3551	4355	22%

## EXHIBIT III-20

INDUSTRY-SPECIFIC SERVICES MARKET  
RETAIL INDUSTRY  
1985-1990

DELIVERY MODE	(\$M) 1984	84-85 GROWTH	(\$M) 1985	(\$M) 1986	(\$M) 1987	(\$M) 1988	(\$M) 1989	(\$M) 1990	AAGR 85-90
PROCESSING SERVICES									
REMOTE COMP/BATCH	500	13%	564	659	776	932	1127	1310	18%
FACILITY MANAGEMENT	12	18%	15	17	19	22	25	31	16%
TOTAL PROCESSING SERVICES	512	13%	579	676	796	954	1153	1340	18%
APPLICATION SOFTWARE									
MAINFRAME/MINI	75	22%	92	125	169	225	297	374	32%
MICRO	23	32%	30	45	68	103	142	190	45%
TOTAL APPLICATION SOFTWARE	98	24%	122	170	236	328	438	563	36%
TURNKEY SYSTEMS	170	17%	198	230	269	321	385	477	19%
TOTAL	780	15%	899	1076	1301	1602	1976	2380	22%

## EXHIBIT III-21

INDUSTRY-SPECIFIC SERVICES MARKET  
WHOLESALE INDUSTRY  
1985-1990

DELIVERY MODE	(\$M) 1984	84-85 GROWTH	(\$M) 1985	(\$M) 1986	(\$M) 1987	(\$M) 1988	(\$M) 1989	(\$M) 1990	AAGR 85-90
PROCESSING SERVICES									
REMOTE COMP/BATCH	185	13%	209	239	276	324	384	455	17%
FACILITY MANAGEMENT	28	17%	32	39	47	57	69	78	19%
TOTAL PROCESSING SERVICES	213	13%	241	277	322	381	452	534	17%
APPLICATION SOFTWARE									
MAINFRAME/MINI	140	22%	170	223	292	376	480	625	30%
MICRO	34	32%	45	65	93	136	180	251	41%
TOTAL APPLICATION SOFTWARE	174	24%	215	288	386	512	661	877	32%
TURNKEY SYSTEMS	191	17%	224	264	314	379	462	564	20%
TOTAL	578	18%	680	829	1022	1273	1575	1975	24%

## EXHIBIT III-22

INDUSTRY-SPECIFIC SERVICES MARKET  
BANKING AND FINANCE INDUSTRY SECTOR  
1985-1990

SEGMENTATION BY DELIVERY MODE	(\$M) 1984	84-85 GROWTH	(\$M) 1985	(\$M) 1986	(\$M) 1987	(\$M) 1988	(\$M) 1989	(\$M) 1990	AAGR 85-90
PROCESSING SERVICES									
REMOTE COMP/BATCH	2061	17%	2411	2865	3388	3978	4656	5583	18%
FACILITY MANAGEMENT	755	19%	898	1056	1240	1450	1660	1900	16%
TOTAL PROCESSING SERVICES	2816	18%	3309	3921	4628	5428	6316	7483	18%
APPLICATION SOFTWARE									
MAINFRAME/MINI	674	25%	845	1140	1539	1883	2379	2989	29%
MICRO	76	24%	94	128	176	234	321	477	38%
TOTAL APPLICATION SOFTWARE	750	25%	939	1268	1715	2117	2700	3466	30%
TURNKEY SYSTEMS	560	15%	644	753	897	1067	1259	1473	16%
TOTAL	4126	19%	4892	5942	7240	8612	10275	12422	20%

INDUSTRY-SPECIFIC SERVICES MARKET  
COMMERCIAL BANKING INDUSTRY  
1985-1990

DELIVERY MODE	(\$M) 1984	84-85 GROWTH	(\$M) 1985	(\$M) 1986	(\$M) 1987	(\$M) 1988	(\$M) 1989	(\$M) 1990	AAGR 85-90
PROCESSING SERVICES									
REMOTE COMP/BATCH	1216	17%	1422	1662	1931	2228	2561	3126	17%
FACILITY MANAGEMENT	529	19%	629	746	883	1041	1202	1364	17%
TOTAL PROCESSING SERVICES	1744	18%	2051	2407	2814	3269	3763	4491	17%
APPLICATION SOFTWARE									
MAINFRAME/MINI	479	25%	600	823	1130	1405	1803	2230	30%
MICRO	40	24%	50	70	100	138	195	281	41%
TOTAL APPLICATION SOFTWARE	519	25%	650	893	1230	1543	1999	2511	31%
TURNKEY SYSTEMS	314	15%	361	446	560	700	866	966	22%
TOTAL	2577	19%	3062	3746	4604	5512	6628	7968	21%



## EXHIBIT III-24

INDUSTRY-SPECIFIC SERVICES MARKET  
SAVINGS AND LOAN INDUSTRY  
1985-1990

DELIVERY MODE	(\$M) 1984	84-85 GROWTH	(\$M) 1985	(\$M) 1986	(\$M) 1987	(\$M) 1988	(\$M) 1989	(\$M) 1990	AAGR 85-90
PROCESSING SERVICES									
REMOTE COMP/BATCH	247	17%	289	338	393	453	521	636	17%
FACILITY MANAGEMENT	60	19%	72	80	89	99	106	129	12%
TOTAL PROCESSING SERVICES	308	17%	361	418	482	552	628	766	16%
APPLICATION SOFTWARE									
MAINFRAME/MINI	108	25%	135	173	222	256	305	407	25%
MICRO	19	24%	24	30	38	47	60	96	33%
TOTAL APPLICATION SOFTWARE	127	25%	159	203	260	303	364	503	26%
TURNKEY SYSTEMS	95	15%	109	120	135	149	164	206	14%
TOTAL	530	19%	629	742	877	1005	1156	1475	19%

## EXHIBIT III-25

INDUSTRY-SPECIFIC SERVICES MARKET  
SECURITIES AND COMMODITIES INDUSTRY  
1985-1990

DELIVERY MODE	(\$M) 1984	84-85 GROWTH	(\$M) 1985	(\$M) 1986	(\$M) 1987	(\$M) 1988	(\$M) 1989	(\$M) 1990	AAGR 85-90
PROCESSING SERVICES									
REMOTE COMP/BATCH	309	17%	362	447	549	668	810	938	21%
FACILITY MANAGEMENT	106	19%	126	144	164	186	206	243	14%
TOTAL PROCESSING SERVICES	415	17%	487	591	713	854	1016	1181	19%
APPLICATION SOFTWARE									
MAINFRAME/MINI	34	25%	42	59	83	105	138	167	32%
MICRO	8	24%	9	13	18	23	32	48	38%
TOTAL APPLICATION SOFTWARE	41	25%	52	72	101	129	170	215	33%
TURNKEY SYSTEMS	101	15%	116	131	151	173	196	239	16%
TOTAL	557	18%	655	794	964	1156	1382	1635	20%

## EXHIBIT III-26

INDUSTRY-SPECIFIC SERVICES MARKET  
OTHER BANKING/FINANCE INDUSTRY  
1985-1990

DELIVERY MODE	(\$M) 1984	84-85 GROWTH	(\$M) 1985	(\$M) 1986	(\$M) 1987	(\$M) 1988	(\$M) 1989	(\$M) 1990	AAGR 85-90
PROCESSING SERVICES									
REMOTE COMP/BATCH	289	17%	338	418	515	629	764	882	21%
FACILITY MANAGEMENT	60	19%	72	87	104	125	146	163	18%
TOTAL PROCESSING SERVICES	349	17%	409	505	619	753	910	1046	21%
APPLICATION SOFTWARE									
MAINFRAME/MINI	54	25%	68	84	105	117	133	185	22%
MICRO	9	24%	11	15	20	25	33	52	35%
TOTAL APPLICATION SOFTWARE	63	25%	79	99	124	142	167	237	25%
TURNKEY SYSTEMS	50	15%	58	56	52	45	33	62	1%
TOTAL	462	18%	546	660	796	940	1109	1344	20%

## EXHIBIT III-27

INDUSTRY-SPECIFIC SERVICES MARKET  
INSURANCE INDUSTRY SECTOR  
1985-1990

SEGMENTATION BY DELIVERY MODE	(\$M) 1984	84-85 GROWTH	(\$M) 1985	(\$M) 1986	(\$M) 1987	(\$M) 1988	(\$M) 1989	(\$M) 1990	AAGR 85-90
PROCESSING SERVICES									
REMOTE COMP/BATCH	273	11%	304	339	383	430	485	564	13%
FACILITY MANAGEMENT	293	9%	319	355	397	449	502	558	12%
TOTAL PROCESSING SERVICES	566	10%	623	694	780	879	987	1122	12%
APPLICATION SOFTWARE									
MAINFRAME/MINI	195	17%	228	288	374	465	550	630	23%
MICRO	46	26%	58	82	115	160	211	282	37%
TOTAL APPLICATION SOFTWARE	241	19%	286	370	489	625	761	912	26%
TURNKEY SYSTEMS	145	13%	164	193	230	281	342	411	20%
TOTAL	952	13%	1073	1257	1499	1785	2090	2445	18%

## EXHIBIT III-28

INDUSTRY-SPECIFIC SERVICES MARKET  
LIFE INSURANCE INDUSTRY  
1985-1990

DELIVERY MODE	(\$M) 1984	84-85 GROWTH	(\$M) 1985	(\$M) 1986	(\$M) 1987	(\$M) 1988	(\$M) 1989	(\$M) 1990	AAGR 85-90
PROCESSING SERVICES									
REMOTE COMP/BATCH	131	11%	146	167	195	224	260	294	15%
FACILITY MANAGEMENT	208	9%	226	248	272	303	332	376	11%
TOTAL PROCESSING SERVICES	339	10%	372	415	467	527	592	671	12%
APPLICATION SOFTWARE									
MAINFRAME/MINI	92	17%	107	134	173	213	250	289	22%
MICRO	26	26%	33	47	67	94	125	166	38%
TOTAL APPLICATION SOFTWARE	118	19%	140	181	240	307	375	454	27%
TURNKEY SYSTEMS	67	13%	75	90	109	136	168	199	21%
TOTAL	524	12%	588	687	816	970	1136	1324	18%



## EXHIBIT III-29

INDUSTRY-SPECIFIC SERVICES MARKET  
PROPERTY AND CASUALTY INDUSTRY  
1985-1990

DELIVERY MODE	(\$M) 1984	84-85 GROWTH	(\$M) 1985	(\$M) 1986	(\$M) 1987	(\$M) 1988	(\$M) 1989	(\$M) 1990	AAGR 85-90
PROCESSING SERVICES									
REMOTE COMP/BATCH	52	11%	58	66	76	87	100	114	15%
FACILITY MANAGEMENT	26	9%	29	31	33	35	37	44	9%
TOTAL PROCESSING SERVICES	78	11%	86	96	108	122	137	157	13%
APPLICATION SOFTWARE									
MAINFRAME/MINI	68	17%	80	101	132	166	197	224	23%
MICRO	15	26%	19	27	38	53	71	94	38%
TOTAL APPLICATION SOFTWARE	83	19%	98	128	170	219	268	318	26%
TURNKEY SYSTEMS	23	13%	26	31	38	47	57	68	21%
TOTAL	184	14%	211	256	316	387	462	544	21%

## EXHIBIT III-30

INDUSTRY-SPECIFIC SERVICES MARKET  
OTHER INSURANCE INDUSTRIES  
1985-1990

DELIVERY MODE	(\$M) 1984	84-85 GROWTH	(\$M) 1985	(\$M) 1986	(\$M) 1987	(\$M) 1988	(\$M) 1989	(\$M) 1990	AAGR 85-90
PROCESSING SERVICES									
REMOTE COMP/BATCH	90	11%	100	106	113	119	125	156	9%
FACILITY MANAGEMENT	59	9%	64	77	92	111	133	138	17%
TOTAL PROCESSING SERVICES	149	10%	164	182	205	230	258	294	12%
APPLICATION SOFTWARE									
MAINFRAME/MINI	35	17%	41	52	69	86	103	117	23%
MICRO	5	26%	6	8	10	13	15	23	29%
TOTAL APPLICATION SOFTWARE	40	18%	47	61	79	99	118	140	24%
TURNKEY SYSTEMS	55	13%	62	71	83	98	116	144	18%
TOTAL	244	12%	274	314	367	428	492	578	16%

## EXHIBIT III-31

INDUSTRY-SPECIFIC SERVICES MARKET  
MEDICAL INDUSTRY SECTOR  
1985-1990

SEGMENTATION BY DELIVERY MODE	(\$M) 1984	84-85 GROWTH	(\$M) 1985	(\$M) 1986	(\$M) 1987	(\$M) 1988	(\$M) 1989	(\$M) 1990	AAGR 85-90
PROCESSING SERVICES									
REMOTE COMPUTING	523	15%	601	708	822	945	1103	1295	17%
FACILITY MANAGEMENT	284	15%	327	379	443	519	602	698	16%
TOTAL PROCESSING SERVICES	807	15%	928	1087	1265	1464	1705	1993	17%
APPLICATION SOFTWARE									
MAINFRAME/MINI	174	45%	252	366	512	717	997	1365	40%
MICRO	30	47%	44	72	113	180	265	392	55%
TOTAL APPLICATION SOFTWARE	204	45%	296	438	625	897	1262	1757	43%
TURNKEY SYSTEMS	445	16%	516	604	713	841	992	1181	18%
TOTAL	1456	20%	1740	2129	2603	3202	3959	4931	23%

## EXHIBIT III-32

INDUSTRY-SPECIFIC SERVICES MARKET  
HOSPITAL INDUSTRY  
1985-1990

DELIVERY MODE	(\$M) 1984	84-85 GROWTH	(\$M) 1985	(\$M) 1986	(\$M) 1987	(\$M) 1988	(\$M) 1989	(\$M) 1990	AAGR 85-90
PROCESSING SERVICES									
REMOTE COMP/BATCH	439	15%	505	592	684	782	909	1072	16%
FACILITY MANAGEMENT	233	15%	268	311	363	426	494	572	16%
TOTAL PROCESSING SERVICES	672	15%	773	903	1047	1208	1403	1645	16%
APPLICATION SOFTWARE									
MAINFRAME/MINI	143	45%	207	296	410	566	778	1078	39%
MICRO	20	47%	29	45	67	101	140	220	50%
TOTAL APPLICATION SOFTWARE	162	45%	235	341	476	667	918	1298	41%
TURNKEY SYSTEMS	343	16%	397	463	543	637	748	895	18%
TOTAL	1177	19%	1406	1706	2067	2513	3069	3838	22%

## EXHIBIT III-33

INDUSTRY-SPECIFIC SERVICES MARKET  
PHYSICIAN/PROFESSIONAL INDUSTRY  
1985-1990

DELIVERY MODE	(\$M) 1984	84-85 GROWTH	(\$M) 1985	(\$M) 1986	(\$M) 1987	(\$M) 1988	(\$M) 1989	(\$M) 1990	AAGR 85-90
PROCESSING SERVICES									
REMOTE COMP/BATCH	73	15%	84	102	122	144	172	197	19%
FACILITY MANAGEMENT	45	15%	52	61	71	83	96	112	16%
TOTAL PROCESSING SERVICES	119	15%	136	163	193	227	268	309	18%
APPLICATION SOFTWARE									
MAINFRAME/MINI	26	45%	38	57	83	120	173	229	43%
MICRO	9	47%	13	24	41	70	111	153	63%
TOTAL APPLICATION SOFTWARE	35	45%	51	81	124	191	285	382	50%
TURNKEY SYSTEMS	89	16%	103	123	148	178	214	250	19%
TOTAL	243	20%	291	367	464	596	767	941	26%

## EXHIBIT III-34

INDUSTRY-SPECIFIC SERVICES MARKET  
OTHER MEDICAL INDUSTRIES  
1985-1990

DELIVERY MODE	(\$M) 1984	84-85 GROWTH	(\$M) 1985	(\$M) 1986	(\$M) 1987	(\$M) 1988	(\$M) 1989	(\$M) 1990	AAGR 85-90
PROCESSING SERVICES									
REMOTE COMP/BATCH	10	15%	12	14	16	19	22	26	17%
FACILITY MANAGEMENT	6	15%	7	8	9	10	12	14	16%
TOTAL PROCESSING SERVICES	16	15%	19	22	25	29	34	40	17%
APPLICATION SOFTWARE									
MAINFRAME/MINI	5	45%	8	12	19	30	46	57	50%
MICRO	2	47%	2	4	6	9	13	20	55%
TOTAL APPLICATION SOFTWARE	7	45%	10	16	25	39	59	77	51%
TURNKEY SYSTEMS	13	16%	15	18	21	25	30	35	18%
TOTAL	36	21%	44	56	72	94	123	152	28%



## EXHIBIT III-35

INDUSTRY-SPECIFIC SERVICES MARKET  
EDUCATION INDUSTRY SECTOR  
1985-1990

SEGMENTATION BY DELIVERY MODE	(\$M) 1984	84-85 GROWTH	(\$M) 1985	(\$M) 1986	(\$M) 1987	(\$M) 1988	(\$M) 1989	(\$M) 1990	AAGR 85-90
PROCESSING SERVICES									
REMOTE COMP/BATCH	49	8%	53	59	65	73	81	90	11%
FACILITY MANAGEMENT	18	6%	19	20	21	22	23	24	5%
TOTAL PROCESSING SERVICES	67	7%	72	79	86	95	104	114	10%
APPLICATION SOFTWARE									
MAINFRAME/MINI	15	13%	17	22	27	33	39	44	21%
MICRO	32	28%	41	56	75	98	126	161	31%
TOTAL APPLICATION SOFTWARE	47	23%	58	78	102	131	165	205	29%
TURNKEY SYSTEMS	77	18%	91	107	127	149	179	215	19%
TOTAL	191	16%	221	264	315	375	448	534	19%

## EXHIBIT III-36

INDUSTRY-SPECIFIC SERVICES MARKET  
SERVICES INDUSTRY SECTOR  
1985-1990

SEGMENTATION BY DELIVERY MODE	(\$M) 1984	84-85 GROWTH	(\$M) 1985	(\$M) 1986	(\$M) 1987	(\$M) 1988	(\$M) 1989	(\$M) 1990	AAGR 85-90
PROCESSING SERVICES									
REMOTE COMP/BATCH	734	16%	853	1020	1202	1409	1637	1900	17%
FACILITY MANAGEMENT	5	20%	6	7	8	9	10	12	15%
TOTAL PROCESSING SERVICES	739	16%	859	1027	1210	1418	1647	1912	17%
APPLICATION SOFTWARE									
MAINFRAME/MINI	69	25%	86	115	153	195	238	287	27%
MICRO	15	60%	24	41	66	102	148	217	55%
TOTAL APPLICATION SOFTWARE	84	31%	110	156	219	297	386	504	36%
TURNKEY SYSTEMS	303	17%	355	443	567	732	951	1256	29%
TOTAL	1126	18%	1324	1626	1996	2447	2984	3672	23%

EXHIBIT III-37

INDUSTRY-SPECIFIC SERVICES MARKET  
FEDERAL GOVERNMENT INDUSTRY SECTOR  
1985-1990

SEGMENTATION BY DELIVERY MODE	(\$M) 1984	84-85 GROWTH	(\$M) 1985	(\$M) 1986	(\$M) 1987	(\$M) 1988	(\$M) 1989	(\$M) 1990	AAGR 85-90
PROCESSING SERVICES									
REMOTE COMP/BATCH	62	15%	71	84	106	127	152	186	21%
FACILITY MANAGEMENT	74	14%	84	97	113	131	152	176	16%
TOTAL PROCESSING SERVICES	136	14%	155	181	219	258	304	362	18%
APPLICATION SOFTWARE									
MAINFRAME/MINI	14	14%	16	20	25	30	36	41	21%
MICRO	3	33%	4	5	7	9	11	14	28%
TOTAL APPLICATION SOFTWARE	17	18%	20	25	32	39	47	55	22%
TURNKEY SYSTEMS	412	22%	503	588	712	854	1016	1230	20%
SECTOR TOTAL	565	20%	678	794	963	1151	1367	1647	19%
OTHER EXPENDITURE BREAKDOWN									
PROFESSIONAL SERVICES									
SOFTWARE DEVELOPEMENT	1098	24%	1362	1647	1928	2313	2729	3248	19%
CONSULTING	292	18%	345	385	459	533	629	717	16%
EDUCATION & TRAINING	234	17%	274	323	420	525	646	807	24%
FACILITY MANAGEMENT	509	11%	565	633	702	773	842	910	10%
SYSTEMS INTEGRATION	630	27%	800	984	1220	1489	1801	2162	22%
TOTAL PROFESSIONAL SERVICES	2763	21%	3346	3972	4729	5633	6647	7844	19%

## EXHIBIT III-38

INDUSTRY-SPECIFIC SERVICES MARKET  
STATE AND LOCAL GOVERNMENT INDUSTRY SECTOR  
1985-1990

SEGMENTATION BY DELIVERY MODE	(\$M) 1984	84-85 GROWTH	(\$M) 1985	(\$M) 1986	(\$M) 1987	(\$M) 1988	(\$M) 1989	(\$M) 1990	AAGR 85-90
PROCESSING SERVICES									
REMOTE COMP/BATCH	51	16%	59	71	85	106	127	160	22%
FACILITY MANAGEMENT	257	15%	296	343	401	473	559	659	17%
TOTAL PROCESSING SERVICES	308	15%	355	414	486	579	686	819	18%
APPLICATION SOFTWARE									
MAINFRAME/MINI	23	13%	26	33	41	49	56	64	20%
MICRO	1	100%	2	3	5	8	13	20	58%
TOTAL APPLICATION SOFTWARE	24	17%	28	36	46	57	69	84	25%
TURNKEY SYSTEMS	80	16%	93	110	130	156	188	227	20%
TOTAL	412	16%	476	560	662	792	943	1130	19%

## EXHIBIT III-39

INDUSTRY-SPECIFIC SERVICES MARKET  
 "OTHER INDUSTRIES" INDUSTRY SECTOR  
 1985-1990

SEGMENTATION BY DELIVERY MODE	(\$M) 1984	84-85 GROWTH	(\$M) 1985	(\$M) 1986	(\$M) 1987	(\$M) 1988	(\$M) 1989	(\$M) 1990	AAGR 85-90
PROCESSING SERVICES									
REMOTE COMPUTING	440	12%	493	567	680	770	917	1075	17%
FACILITY MANAGEMENT	8	13%	9	10	11	12	13	14	9%
TOTAL PROCESSING SERVICES	448	12%	502	577	691	782	930	1089	17%
APPLICATION SOFTWARE									
MAINFRAME/MINI	50	26%	63	87	118	153	190	235	30%
MICRO	3	67%	5	8	13	20	27	40	52%
TOTAL APPLICATION SOFTWARE	53	28%	68	95	131	173	217	275	32%
TURNKEY SYSTEMS	86	15%	99	116	137	164	200	244	20%
TOTAL	587	14%	669	788	959	1119	1347	1608	19%

EXHIBIT III-40

CROSS-INDUSTRY SERVICES MARKET  
PLANNING AND ANALYSIS SEGMENT  
BY DELIVERY MODE  
1985-1990

DELIVERY MODE	(\$M) 1984	84-85 GROWTH	(\$M) 1985	(\$M) 1986	(\$M) 1987	(\$M) 1988	(\$M) 1989	(\$M) 1990	AAGR 85-90
REMOTE COMPUTING/BATCH	725	14%	829	957	1107	1281	1464	1626	14%
APPLICATION SOFTWARE									
MAINFRAME/MINI	481	25%	603	787	992	1196	1401	1596	21%
MICRO	564	22%	686	847	999	1100	1198	1294	14%
TOTAL APPLICATION SOFTWARE	1045	23%	1289	1634	1991	2296	2599	2890	18%
TURNKEY SYSTEMS	210	15%	242	281	332	420	510	602	20%
CROSS-INDUSTRY TOTAL	1980	19%	2360	2872	3430	3997	4573	5118	17%



## EXHIBIT III-41

CROSS-INDUSTRY SERVICES MARKET  
ACCOUNTING SEGMENT  
BY DELIVERY MODE  
1985-1990

DELIVERY MODE	(\$M) 1984	84-85 GROWTH	(\$M) 1985	(\$M) 1986	(\$M) 1987	(\$M) 1988	(\$M) 1989	(\$M) 1990	AAGR 85-90
REMOTE COMP/BATCH	922	12%	1033	1167	1330	1530	1775	2058	15%
APPLICATION SOFTWARE									
MAINFRAME/MINI	806	13%	912	1098	1307	1489	1631	1785	14%
MICRO	195	37%	267	375	506	635	737	820	25%
TOTAL APPLICATION SOFTWARE	1001	18%	1179	1473	1813	2124	2368	2605	17%
TURNKEY SYSTEMS	325	15%	376	413	459	500	545	590	20%
CROSS-INDUSTRY TOTAL	2248	15%	2588	3053	3602	4154	4688	5253	15%

## EXHIBIT III-42

CROSS-INDUSTRY SERVICES MARKET  
HUMAN RESOURCES SEGMENT  
BY DELIVERY MODE  
1985-1990

DELIVERY MODE	(\$M) 1984	84-85 GROWTH	(\$M) 1985	(\$M) 1986	(\$M) 1987	(\$M) 1988	(\$M) 1989	(\$M) 1990	AAGR 85-90
REMOTE COMPUTING/BATCH	799	12%	893	992	1111	1252	1420	1598	12%
APPLICATION SOFTWARE									
MAINFRAME/MINI	362	13%	410	485	563	630	690	768	13%
MICRO	35	14%	40	49	62	76	90	107	22%
TOTAL APPLICATION SOFTWARE	397	13%	450	534	625	706	780	875	14%
TURNKEY SYSTEMS	187	17%	218	242	285	327	373	414	14%
CROSS-INDUSTRY TOTAL	1383	13%	1561	1768	2021	2285	2573	2887	13%

*or region or State*

*California - Pacific Coast*

## EXHIBIT III-43

CROSS-INDUSTRY SERVICES MARKET  
ENGINEERING AND SCIENTIFIC SEGMENT  
BY DELIVERY MODE  
1985-1990

DELIVERY MODE	(\$M) 1984	84-85 GROWTH	(\$M) 1985	(\$M) 1986	(\$M) 1987	(\$M) 1988	(\$M) 1989	(\$M) 1990	AAGR 85-90
REMOTE COMPUTING/BATCH	790	16%	915	1084	1285	1524	1798	2116	16%
APPLICATION SOFTWARE									
MAINFRAME/MINI	127	18%	150	191	242	302	361	436	24%
MICRO	26	23%	32	43	58	77	98	125	31%
TOTAL APPLICATION SOFTWARE	153	19%	182	234	300	379	459	561	25%
TURNKEY SYSTEMS	235	19%	280	322	390	465	552	650	18%
CROSS-INDUSTRY TOTAL	1178	17%	1377	1640	1975	2368	2809	3327	19%

## EXHIBIT III-44

CROSS-INDUSTRY SERVICES MARKET  
EDUCATION AND TRAINING SEGMENT  
BY DELIVERY MODE  
1985-1990

DELIVERY MODE	(\$M) 1984	84-85 GROWTH	(\$M) 1985	(\$M) 1986	(\$M) 1987	(\$M) 1988	(\$M) 1989	(\$M) 1990	AAGR 85-90
REMOTE COMPUTING/BATCH	79	11%	88	98	110	122	134	148	11%
APPLICATION SOFTWARE									
MAINFRAME/MINI	22	36%	30	43	61	83	108	138	36%
MICRO	38	42%	54	82	125	186	268	383	48%
TOTAL APPLICATION SOFTWARE	60	40%	84	125	186	269	376	521	44%
TURNKEY SYSTEMS	103	18%	122	140	162	187	205	235	14%
CROSS-INDUSTRY TOTAL	242	21%	294	363	458	578	715	904	25%

## EXHIBIT III-45

CROSS-INDUSTRY SERVICES MARKET  
 "OTHER APPLICATIONS" SEGMENT  
 BY DELIVERY MODE  
 1985-1990

DELIVERY MODE	(\$M) 1984	83-84 GROWTH	(\$M) 1985	(\$M) 1986	(\$M) 1987	(\$M) 1988	(\$M) 1989	(\$M) 1990	AAGR 85-90
REMOTE COMPUTING/BATCH	332	12%	372	420	479	551	628	710	14%
APPLICATION SOFTWARE									
MAINFRAME/MINI	150	13%	170	204	249	294	327	364	16%
MICRO	335	15%	386	472	590	712	826	950	20%
TOTAL APPLICATION SOFTWARE	485	15%	556	676	839	1006	1153	1314	19%
TURNKEY SYSTEMS	995	9%	1089	1255	1435	1640	1950	2230	15%
CROSS-INDUSTRY TOTAL	1812	11%	2017	2351	2753	3197	3731	4254	16%

#### IV FORECAST RECONCILIATION





#### IV FORECAST RECONCILIATION

- This section analyzes the important differences between the 1984 and the 1985 industry forecasts.
- The overall market slowdown in 1985 contributed to the majority of the differences between the 1984 and 1985 forecasts in regard to the five-year outlook.
  - The overall market, however, remains an attractive one, substantial in size and growing at an average annual rate of 20%.
  - The differences vary by delivery modes and other segmentation criteria. These will be analyzed individually.
- The total information services market was projected to be \$39 billion in the 1984 report. As shown in Exhibit IV-1, the reconciled market size exceeded that forecast by 6%. The major contributors to this were:
  - The processing facilities management reconciled forecast exceeded the 1984 forecast by 20%. This is primarily due to a reclassification of revenue from professional services facilities management to processing facilities management for expenditures for Medicare and Medicaid.
  - Systems software growth exceeded the 1984 forecast by 14% due to reclassifying some application development tools into the systems software category.

## EXHIBIT IV-1

RECONCILIATION OF INFORMATION SERVICES MARKETS  
BY DELIVERY MODE

DELIVERY MODE	1984 MARKET						84-89 AAGR FORECAST	85-90 AAGR FORECAST
	1984 FORECAST (\$M)	1985 REPORT (\$M)	VARIANCE AS % OF '85 RPRT	1984 FORECAST (\$M)	1985 FORECAST (\$M)	VARIANCE AS % OF '85 FCST	IN '84 REPORT (%)	IN '85 REPORT (%)
REMOTE COMPUTING/BATCH								
INDUSTRY SPECIFIC	6445	6787	-5%	13293	17512	-24%	13%	17%
CROSS INDUSTRY	3964	4254	-7%	8339	10408	-20%	13%	16%
UTILITY PROCESSING	1828	1789	2%	2677	2537	6%	7%	6%
SUBTOTAL	12237	12830	-5%	24309	30457	-20%	12%	16%
FACILITIES MANAGEMENT								
INDUSTRY SPECIFIC	1453	1864	-22%	3811	4436	-14%	17%	16%
CROSS INDUSTRY	55	57	-4%	57	71	-20%	1%	3%
UTILITY PROCESSING	136	142	-4%	398	332	20%	19%	16%
SUBTOTAL	1644	2063	-20%	4266	4839	-12%	17%	15%
TOTAL PROCESSING SERVICES								
INDUSTRY SPECIFIC	7898	8651	-9%	17099	21948	-22%	14%	17%
CROSS INDUSTRY	4019	4311	-7%	8397	10479	-20%	13%	16%
UTILITY PROCESSING	1964	1931	2%	3069	2869	7%	8%	7%
VANS	288	290	-1%	1463	1270	15%	31%	28%
TOTAL	14169	15183	-7%	30028	36566	-18%	13%	16%
SOFTWARE PRODUCTS								
APPLICATION SOFTWARE PRODUCTS								
INDUSTRY SPECIFIC	2792	2600	7%	17913	12784	40%	35%	32%
CROSS INDUSTRY	3176	3141	1%	12851	8766	47%	20%	19%
TOTAL APPLICATIONS SOFTWARE	5969	5741	4%	30764	21550	43%	31%	25%
TOTAL SYSTEM SOFTWARE	4600	5333	-14%	21151	19651	8%	29%	25%
TOTAL SOFTWARE	10569	11074	-5%	51841	41201	26%	31%	25%
TOTAL PROFESSIONAL SERVICES	8564	8856	-3%	26134	26315	-1%	20%	20%
TURNKEY SYSTEMS								
INDUSTRY SPECIFIC	3830	4325	-11%	16971	12646	34%	28%	20%
CROSS INDUSTRY	1944	2055	-5%	7604	4721	61%	26%	15%
TOTAL TURNKEY SYSTEMS	5775	6380	-9%	24575	17367	42%	27%	19%
GRAND TOTAL	39097	41493	-6%	132578	121449	9%	22%	20%

- Turnkey system revenues were 9% higher in the 1985 forecast due to the addition of value-added resellers not previously counted in this segment.
- The increase in size of the remote computing/batch services and the professional services segments contributed the balance of the significant differences between 1984 and 1985.
- The primary reason for these variations is the availability of more complete data on 1984 expenditures. Forecasting 1984 expenditures in 1984 required INPUT estimates whereas by 1985 few estimates were required.
- Exhibit IV-1 also shows the variances by industry-specific/cross-industry categories.
  - The industry-specific segments, other than applications software, exceeded the 1984 forecast. Again this primarily was a result of shifting expenditures from federal to state and local.
  - The cross-industry segments demonstrated a slight upward variation, again with exception of applications software.
- For the extended forecast, the variances are of the scaling-back nature, moving downward 9% for the 1985-1990 average annual growth. The reduction in the forecast from 22% to 20% is based on a number of factors:
  - Software products markets are reaching a size where the growth of 40+% is very difficult to sustain. Therefore, INPUT has revised the long-range forecast to the 25% growth level. Details are discussed in Section B.

- In turnkey systems, the downsizing of hardware price levels is expected to have a major impact. This and other factors dictate the lower growth projections of 19% through 1990 versus the previous 42% level. Section D covers the specifics of this revision.
- Processing/network services growth is now expected to exceed the previous forecast. This is due to increasing optimism for the network services products and the shifting of some facilities management from professional services to processing/network services.
- The balance of this section will cover the reconciliation by each of the major categories followed by reconciliations of the industry-specific and cross-industry market forecasts.

#### A. PROCESSING/NETWORK SERVICES

- The processing/network services market segment grew 7% more than predicted in 1984 and is now a \$15 billion market.
  - For the forecast period, the growth rate has been raised from 13% to 16%.
  - The significant variations are in the remote computing/batch services and industry-specific facilities management segments.
- The underlying reasons for these variances in the 1984/1985 forecasts are many. Some of the major ones are:
  - Better than expected performance from traditional segments. For example, payroll services continued to grow substantially as did correspondent bank services.

- The facilities management segment also exceeded INPUT's expectations. The reason for this is selected industries began moving more quickly than expected to develop FM buying patterns. This is a trend that should be continuing as more pressure builds to develop complex systems in industries like banking, manufacturing, insurance, and medical.
- The absorption problem in installing new systems internally has resulted in some external systems' lives being extended, a favorable impact for processing/network services.
- The five-year average annual growth rate has increased as stated and resulted in a \$36 billion segment, up from \$30 billion last year. As stated, the major variances from 1984 are in remote computing/batch services and processing facilities management.
  - As in the short term, the FM market appears to be accelerating and it is predicted to maintain that accelerated pace, especially in the industries mentioned above. Additionally, sophisticated vendors like EDS, Systematics, MTECH, and others will maintain marketing pressure on this emerging trend, which will have a positive effect on growth.
  - In remote computing/batch services, some of the short-term factors mentioned above will contribute to the increase. Additionally, other factors will work to produce the higher prediction.
    - The emphasis on network connectivity will continue to expand, benefiting this segment.
    - The activity in Electronic Data Interchange is increasing and will provide incremental revenue earlier than previously predicted.



- End-user computing is creating more computer-literate users who are using on-line data bases at a higher rate than expected.
- Industry-specific products and services are sustaining growth levels that the previous forecast had predicted would level off in the 1986-1989 timeframe.
- The banking and finance industry sector is seen as growing and is contributing more than one-half of the increase over the 1984 forecast.
  - Increased activity in ATM, POS, and ACH networks will result in higher revenues.
  - The competitive pressure in this sector is maintaining the pressure to implement solutions in the most expedient manner, thus benefiting the processing/network services segment.

## B. SOFTWARE PRODUCTS

- The software products market growth from 1984 to 1985 exceeded the previous forecast by 5%. This was a result of a better than expected performance in systems software and a poor performance in application software.
  - The industry-specific and cross-industry reconciliation will analyze much of the details for the variances in applications software.
  - The strong performance of the systems software segment is primarily a result of the following:

- . A strong performance by IBM, including price increases on most systems software products, is the dominant cause for the variance.
- . IS organizations responded to a number of IBM announcements. As usual, IS holds back, waiting for the "other shoe" to drop. In 1985, a number of lesser product announcements gave IS confidence to proceed. In other years, these developments may have been spread over two years.
- The more dramatic variation in INPUT's forecast for software products is in the five-year projections. This revision is the result of a number of factors, the most significant being the overall slowdown in the computer industry.
  - The slowdown is expected to have the least affect on the systems software area, where INPUT has revised the forecast only 8%, moving the growth rate from 29% to 25% average annual growth for the balance of the decade.
- In the systems software area there will be a number of events to offset the industry slowdown including new products for networks and other telecommunications software.
- INPUT expects IBM, in particular, to emphasize systems software products in their drive for higher software products revenues.
- INPUT is much less optimistic about the applications software markets and the forecast has been revised downward. The average annual growth is now expected to be 25%, down from 43% last year. Some of the reasons for this are:
  - The slowdown in real growth from 1984 to 1985. Much of this can be attributed to the implementation bottleneck.

- Recent failures of companies to develop large complex applications packages. Disappointment over Anacomp, Hogan, and Walker Interactive has created a pessimism in many IS organizations. This will, at best, lengthen the sales cycle for other vendors.
  - As applications software vendors have grown, so has the magnitude of their management problem. As these firms grow into \$100 million plus organizations, they are doing so with the staffs and structures of \$50 million companies. Making the transition will cause them to lose some of their momentum, especially in their sales organizations.
  - Other factors discussed in Chapter II, such as hardware shipments, discounting, and recurring revenue strategies, are also considerations in the forecast revision.
  - There are also a number of factors that will be discussed in the industry-specific and cross-industry sections that follow later in this section.
- In conclusion, it must be noted that the software products market is still projected to grow at 25%, an exceptionally healthy rate in most industries and the highest rate of the four major delivery modes forecasted by INPUT.

### C. PROFESSIONAL SERVICES

- The professional services segment is the most stable of the four delivery modes. INPUT's forecast for the 1985-1990 timeframe has been revised only 1% upward.

- Professional services is expected to continue a healthy 20% growth rate through the forecast period.
- There are a few key issues to watch relative to the professional services market.
  - There is potential for increased growth since user demand is expected to be higher than the 20% projected growth rate and vendors apparently have room for price increases.
  - There is corresponding potential for decreased growth, the issue being the ability of the industry to find, train, and retain their professional staff.
  - There are upside and downside implications dependent on the availability of productivity tools and systems, either from software products vendors or from professional services companies' own R&D.

#### D. TURNKEY SYSTEMS

- The 1985 forecast for turnkey systems was revised upward 9% for the 1984 market. This reconciliation reflects, primarily, the impact of the value-added reseller (VAR) segment of the industry.
  - While these VARs had a greater than expected impact on the turnkey systems market in 1984, INPUT doubts their long-term contribution will be significant.
  - Regardless of the VAR contribution, the growth from 1984 to 1985 was a very disappointing 16%.

- The retarded growth from 1984 to 1985 and number of other issues discussed below have caused INPUT to revise the five-year forecast downward from 27% to 19% for this period.
- The major factors for downward pressure were discussed in Chapter II. They include:
  - Viability of the VAR concept.
  - Value-added pricing and the ability to hold price levels.
  - Reluctance to use "custom" hardware.
- Another issue contributing to the downsizing is the distribution issue surrounding turnkey systems in the \$30,000 to \$75,000 price range. Vendors must realize the cost of sales ratios for large ticket items cannot be translated into these lower-priced products. The result is either different distribution channels or different pricing to reflect true costs of sales.
- Other industry-specific and cross-industry factors relative to turnkey systems will be discussed later.

## E. OTHER SEGMENTATIONS

### I. INDUSTRY-SPECIFIC SECTOR ANALYSIS

- Exhibits IV-2 through IV-15 show the reconciliation data for the industry-specific market sectors. The following are comments on the major areas of variance from last year's forecast.



a. Discrete Manufacturing

- As seen in Exhibit IV-2, the five-year projection for processing/network services is up 11%. The major reasons are increased expenditure plans for EDI and accelerating interest in automation from new and smaller manufacturing firms.
- The applications software sector increased by 33%, primarily due to greater than expected expenditures for products to interface (not integrate) "islands of automation" and for products to replace gut-level applications that were hard coded and posed future problems for interfacing and integration.
- The downsizing of 35% for applications software for the five-year projection is a reflection of both a downsizing of the entire software market and a belief that this sector will require more customized solutions than previously expected.
- The turnkey systems forecast has been revised from 29% to 21%. This is mainly for the same reasons cited for the overall turnkey systems market.

b. Process Manufacturing

- The short-term forecast shown in Exhibit IV-3 reflects a 10% decrease in remote computing/batch services. This is primarily due to slowdown in processing and overall economics of the sector in 1985. This delivery mode, however, is expected to increase 19% in the five-year forecast primarily due to the same competitive/productivity issues surrounding the discrete sector. The energy issue will be the biggest unknown. If petroleum prices rebound, causing another exploration binge, this sector could go even higher.
- The performance of turnkey systems was retarded by the economy in this sector. For the longer term, the forecast has been revised downward primarily on the belief that this sector will concentrate on more customized



## EXHIBIT IV-2

RECONCILIATION OF DISCRETE MANUFACTURING SECTOR  
INDUSTRY-SPECIFIC MARKET FORECAST

DELIVERY MODE	1984 MARKET			1990 MARKET			84-89 AAGR FORECAST	85-90 AAGR FORECAST
	1984 FORECAST (\$M)	1985 REPORT (\$M)	VARIANCE AS % OF '85 RPRT	1984 FORECAST (\$M)	1985 FORECAST (\$M)	VARIANCE AS % OF '85 FCST	IN '84 REPORT (%)	IN '85 REPORT (%)
PROCESSING SERVICES								
REMOTE COMPUTING/BATCH SERV.	675	669	1%	1631	1842	-11%	16%	19%
FACILITY MANAGEMENT	36	38	-5%	94	92	2%	17%	16%
TOTAL PROCESSING SERVICES	711	707	1%	1725	1934	-11%	16%	19%
APPLICATION SOFTWARE	416	624	-33%	2852	2120	35%	38%	24%
TURNKEY SYSTEMS	1212	1242	-2%	5417	3810	42%	29%	21%

## EXHIBIT IV-3

RECONCILIATION OF PROCESS MANUFACTURING SECTOR  
INDUSTRY-SPECIFIC MARKET FORECAST

DELIVERY MODE	1984 MARKET			1990 MARKET			84-89 AAGR FORECAST	85-90 AAGR FORECAST
	1984 FORECAST (\$M)	1985 REPORT (\$M)	VARIANCE AS % OF '85 RPRT	1984 FORECAST (\$M)	1985 FORECAST (\$M)	VARIANCE AS % OF '85 FCST	IN '84 REPORT (%)	IN '85 REPORT (%)
PROCESSING SERVICES								
REMOTE COMPUTING/BATCH SERV.	735	666	10%	1306	1606	-19%	10%	16%
FACILITY MANAGEMENT	38	40	-5%	112	102	10%	21%	17%
TOTAL PROCESSING SERVICES	773	706	9%	1418	1708	-17%	11%	16%
APPLICATION SOFTWARE	131	124	6%	914	852	7%	38%	40%
TURNKEY SYSTEMS	409	301	36%	1668	655	155%	26%	14%

solutions and on delivery modes such as processing/network services that allow for more flexibility in controlling expenses.

c. Transportation

- Exhibit IV-4 shows a 41% increase in remote computing/batch services. This nearly \$200 million variance results from increased expectations for on-line data base services for rates and tariffs, and for faster than expected growth of EDI applications.
- This sector is expected to remain a high growth area for applications software primarily due to a relatively lower level of sophistication in implementing internal systems.
- The turnkey forecast will be impacted to the greatest extent. This revision reflects INPUT's current belief that this sector has not attracted the attention of vendors to develop systems. Opportunities for turnkey systems for distribution, traffic management, and shipping/receiving management have not emerged, causing INPUT to believe vendors either do not recognize the demand or have technical or market reservation.

d. Utilities

- As shown in Exhibit IV-5, there are no significant variations in the forecast.

e. Telecommunications

- Exhibit IV-6 shows statistically important variances in both long- and short-term projections for remote computing/batch services.
  - The short-term variance reflects a shift in classifying some revenue from FM to remote computing due to a better understanding of several large contracts.

## EXHIBIT IV-4

RECONCILIATION OF TRANSPORTATION SECTOR  
INDUSTRY-SPECIFIC MARKET FORECAST

DELIVERY MODE	1984 MARKET			1990 MARKET			84-89 AAGR FORECAST IN '84 REPORT (%)	85-90 AAGR FORECAST IN '85 REPORT (%)
	1984 FORECAST (\$M)	1985 REPORT (\$M)	VARIANCE AS % OF '85 RPRT	1984 FORECAST (\$M)	1985 FORECAST (\$M)	VARIANCE AS % OF '85 FCST		
PROCESSING SERVICES								
REMOTE COMPUTING/BATCH SERV.	132	165	-20%	281	475	-41%	13%	20%
FACILITY MANAGEMENT	24	25	-4%	40	33	21%	9%	5%
TOTAL PROCESSING SERVICES	156	190	-18%	321	508	-37%	13%	19%
APPLICATION SOFTWARE	116	102	14%	900	763	18%	41%	42%
TURNKEY SYSTEMS	145	109	33%	694	305	128%	30%	20%

## EXHIBIT IV-5

RECONCILIATION OF UTILITIES SECTOR  
INDUSTRY-SPECIFIC MARKET FORECAST

DELIVERY MODE	1984 MARKET      1990 MARKET						84-89 AAGR FORECAST IN '84 REPORT (%)	85-90 AAGR FORECAST IN '85 REPORT (%)
	1984 FORECAST (\$M)	1985 REPORT (\$M)	VARIANCE AS % OF '85 RPRT	1984 FORECAST (\$M)	1985 FORECAST (\$M)	VARIANCE AS % OF '85 FCST		
PROCESSING SERVICES								
REMOTE COMPUTING/BATCH SERV.	116	121	-4%	272	226	20%	16%	11%
FACILITY MANAGEMENT	2	11	-82%	2	19	-89%	-2%	10%
TOTAL PROCESSING SERVICES	118	132	-11%	274	245	12%	15%	11%
APPLICATION SOFTWARE	27	23	17%	100	91	10%	25%	28%
TURNKEY SYSTEMS	41	35	17%	105	98	7%	17%	20%

## EXHIBIT IV-6

RECONCILIATION OF TELECOMMUNICATIONS SECTOR  
INDUSTRY-SPECIFIC MARKET FORECAST

DELIVERY MODE	1984 MARKET <span style="color: red;">89</span> 1990 MARKET						34-89 AAGR FORECAST IN '84 REPORT (%)	85-90 AAGR FORECAST IN '85 REPORT (%)
	1984 FORECAST (\$M)	1985 REPORT (\$M)	VARIANCE AS % OF '85 RPRT	1984 FORECAST (\$M)	1985 FORECAST (\$M)	VARIANCE AS % OF '85 FCST		
PROCESSING SERVICES								
REMOTE COMPUTING/BATCH SERV.	125	288	-57%	323	745	-57%	17%	17%
FACILITY MANAGEMENT	10	16	-38%	15	40	-63%		17%
TOTAL PROCESSING SERVICES	135	304	-56%	338	785	-57%	16%	17%
APPLICATION SOFTWARE	40	35	14%	206	260	-21%	31%	41%
TURNKEY SYSTEMS	105	169	-38%	383	500	-23%	24%	20%



- The long-term variance is partially due to the same reason. The other major factor in the five-year window is INPUT's prediction that the smaller, more competitive business units will, in fact, be more aggressive than expected and have more authority to act independently, thus creating a better market for on-line data base services and other processing services products.
- The turnkey system's forecast was revised upward primarily due to more information becoming available following the divestiture actions. This remains a somewhat confusing area and may require further revision in 1986.
- The five-year growth for turnkey products has been revised upward 23% over the 1984 report, reflecting:
  - A higher 1984 base than projected in 1984.
  - An expansion of the available market resulting from the diversification activities of the RBOCs.

f. Distribution

- The distribution sector, as seen in Exhibit IV-7, has a significant variance in remote computing/batch services. This 27% increase in the predicted market results from the following reasons.
  - INPUT now believes firms will be more willing to invest in automation to control costs and improve customer service.
  - Management in this sector now appears to be less inclined than many other sectors to buy applications software to solve automation problems. Rather, it appears they will prefer "quasi-processing" FM solutions which also allow them to be less dependent on internal data

# EXHIBIT IV-7

## RECONCILIATION OF DISTRIBUTION SECTOR INDUSTRY-SPECIFIC MARKET FORECAST

DELIVERY MODE	1984 MARKET			1990 MARKET			84-89 AAGR FORECAST IN '84 REPORT (%)	85-90 AAGR FORECAST IN '85 REPORT (%)
	1984 FORECAST (\$M)	1985 REPORT (\$M)	VARIANCE AS % OF '85 RPRT	1984 FORECAST (\$M)	1985 FORECAST (\$M)	VARIANCE AS % OF '85 FCST		
PROCESSING SERVICES								
REMOTE COMPUTING/BATCH SERV.	662	685	-3%	1317	1765	-25%	12%	18%
FACILITY MANAGEMENT	38	40	-5%	53	109	-51%	6%	18%
TOTAL PROCESSING SERVICES	700	725	-3%	1370	1874	-27%	12%	18%
APPLICATION SOFTWARE	384	272	41%	2957	1440	105%	37%	34%
TURNKEY SYSTEMS	399	361	-17%	1332	1041	28%	28%	20%

processing. This is especially true in the case of smaller firms entering into automation for the first time.

- The forecast for applications software was revised downward by 105%. The reason is this sector has postponed decisions, waiting to see the developments in the manufacturing sectors in order to assess those changes and the potential impact on the distribution industry.
- On the five-year horizon, INPUT believes the major companies will postpone some decisions and will follow the lead of manufacturers both in implementing custom solutions and in trying to design systems capable of interfacing or networking with major manufacturers.
- While the growth in turnkey systems was up slightly, the long-term outlook has been revised downward for two reasons:
  - Large distributors will lean more to customized systems.
  - The growth will be sustained by smaller companies, resulting in lower unit sales prices and correspondingly lower expenditures.

g. Banking and Finance

- Exhibit IV-8 shows the reconciliation of the banking and finance sector. The discussion of the major five-year variances follows.
  - Based on INPUT's extensive multiclient study, the strength of this very large segment has been verified. The previous forecast was tempered due to questions about the ability of the sector to absorb technology, not the underlying demand. The multiclient study results validated the demand and the ability of the institutions to facilitate growth.

# EXHIBIT IV-8

## RECONCILIATION OF BANKING AND FINANCE SECTOR INDUSTRY-SPECIFIC MARKET FORECAST

DELIVERY MODE	1984 MARKET			1990 MARKET			84-89 AAGR FORECAST IN '84	85-90 AAGR FORECAST IN '85
	1984 FORECAST (\$M)	1985 REPORT (\$M)	VARIANCE AS % OF '85 RPRT	1984 FORECAST (\$M)	1985 FORECAST (\$M)	VARIANCE AS % OF '85 FCST	REPORT (%)	REPORT (%)
PROCESSING SERVICES								
REMOTE COMPUTING/BATCH SERV.	1970	2061	-4%	4218	5583	-24%	14%	18%
FACILITY MANAGEMENT	720	755	-5%	2136	1900	12%	20%	16%
TOTAL PROCESSING SERVICES	2690	2816	-4%	6354	7483	-15%	16%	18%
APPLICATION SOFTWARE	750	750	0%	5418	3466	56%	39%	30%
TURNKEY SYSTEMS	560	560	0%	2120	1473	44%	25%	18%

- The predicted level of ATM and POS shipments will require increased expenditures for network services, including third-party services of banking-specific networks and applications.
- The FM category has been revised downward slightly due to INPUT's belief the vendor community can only respond to the 16% growth level. This constraint results from the limitations on vendors' abilities to create capital for FM, staff for these complex contracts, and negotiate and administer the contracts.
- Although the market for applications software has been revised downward, it is still a very substantial one. This revision is primarily a result of the failure to meet the high hopes previously held for Hogan Systems, Anacomp, and others.
- For turnkey systems, the revision reflects the general market trends for these products, and INPUT believes the banking and finance sector will follow course.

#### h. Insurance

- Exhibit IV-9 shows that applications software in this sector has been substantially revised to reflect not only the general industry direction, but also the direction of the insurance industry. Two factors are responsible:
  - The property and casualty sector has had poor results and that has impacted near-term expenditures.
  - Large insurers have impacted the vendors by competing in the agent sector.
- The revision of the long-term projection is based on the perception that turnkey system vendors will maintain unit shipments, but at lower unit rates than previously projected.

# EXHIBIT IV-9

## RECONCILIATION OF INSURANCE SECTOR INDUSTRY-SPECIFIC MARKET FORECAST

DELIVERY MODE	1984 MARKET			1990 MARKET			84-89 AAGR FORECAST IN '84 REPORT (%)	85-90 AAGR FORECAST IN '85 REPORT (%)
	1984 FORECAST (\$M)	1985 REPORT (\$M)	VARIANCE AS % OF '85 RPRT	1984 FORECAST (\$M)	1985 FORECAST (\$M)	VARIANCE AS % OF '85 FCST		
PROCESSING SERVICES								
REMOTE COMPUTING/BATCH SERV.	259	273	-5%	475	564	-16%	11%	13%
FACILITY MANAGEMENT	290	293	-4%	597	558	7%	13%	12%
TOTAL PROCESSING SERVICES	539	566	-5%	1072	1122	-4%	12%	12%
APPLICATION SOFTWARE	409	241	70%	1710	912	88%	27%	26%
TURNKEY SYSTEMS	138	145	-5%	587	411	43%	28%	20%



- The recent trend toward corporate self-insurance and self-administration will also continue to impact the industry and this market.

i. Medical

- The medical market (see Exhibit IV-10) has been increased 19% for the five-year period. The main reasons for this are:
  - The ability of HBO and others to respond to the demand.
  - The success of vendors like McDonnell Douglas Physician Systems' acquisition, Science Dynamics, in protecting service revenue from micro/mini encroachment by providing on-site micro products. This strategy provides a new revenue stream while minimizing the erosion of revenues from the host.
  - INPUT believes the increase in turnkey systems performance in this sector, largely created by micro-based systems, will have a corresponding impact on the other delivery modes.
- The applications software segment has increased slightly due to the apparent awakening of the individual physician/professional segment, again largely created by the micro evolution.

j. Education

- As shown in Exhibit IV-11, there were no significant variations in the forecast.

k. Services

- Exhibit IV-12 shows that the services sector will increase by 28% from the previous projection. The main reason is the accelerating user demand for on-

# EXHIBIT IV-10

## RECONCILIATION OF MEDICAL SECTOR INDUSTRY-SPECIFIC MARKET FORECAST

DELIVERY MODE	1984 MARKET			1990 MARKET			84-89 AAGR FORECAST IN '84 REPORT (%)	85-90 AAGR FORECAST IN '85 REPORT (%)
	1984 FORECAST (\$M)	1985 REPORT (\$M)	VARIANCE AS % OF '85 RPRT	1984 FORECAST (\$M)	1985 FORECAST (\$M)	VARIANCE AS % OF '85 FCST		
PROCESSING SERVICES								
REMOTE COMPUTING/BATCH SERV.	500	523	-4%	1051	1295	-19%	13%	17%
FACILITY MANAGEMENT	271	284	-5%	700	698	0%	17%	16%
TOTAL PROCESSING SERVICES	771	807	-4%	1751	1993	-12%	15%	17%
APPLICATION SOFTWARE	239	204	17%	1576	1757	-10%	38%	43%
TURNKEY SYSTEMS	157	445	-65%	857	1181	-27%	33%	18%

# EXHIBIT IV-11

## RECONCILIATION OF EDUCATION SECTOR INDUSTRY-SPECIFIC MARKET FORECAST

DELIVERY MODE	1984 MARKET      1990 MARKET						84-89 AAGR FORECAST	85-90 AAGR FORECAST
	1984 FORECAST (\$M)	1985 REPORT (\$M)	VARIANCE AS % OF '85 RPRT	1984 FORECAST (\$M)	1985 FORECAST (\$M)	VARIANCE AS % OF '85 FCST	IN '84 REPORT (%)	IN '85 REPORT (%)
PROCESSING SERVICES								
REMOTE COMPUTING/BATCH SERV.	47	49	-4%	67	90	-26%	6%	11%
FACILITY MANAGEMENT	17	18	-6%	35	24	46%	12%	5%
TOTAL PROCESSING SERVICES	64	67	-4%	102	114	-11%	8%	10%
APPLICATION SOFTWARE	39	47	-17%	158	205	-23%	26%	29%
TURNKEY SYSTEMS	75	77	-3%	278	215	29%	19%	19%

## EXHIBIT IV-12

RECONCILIATION OF SERVICES SECTOR  
INDUSTRY-SPECIFIC MARKET FORECAST

DELIVERY MODE	1984 MARKET			1990 MARKET			84-89 AAGR FORECAST IN '84 REPORT (%)	85-90 AAGR FORECAST IN '85 REPORT (%)
	1984 FORECAST (\$M)	1985 REPORT (\$M)	VARIANCE AS % OF '85 RPRT	1984 FORECAST (\$M)	1985 FORECAST (\$M)	VARIANCE AS % OF '85 FCST		
PROCESSING SERVICES								
REMOTE COMPUTING/BATCH SERV.	712	734	-3%	1369	1900	-28%	12%	17%
FACILITY MANAGEMENT	2	5	-60%	6	12	-50%		15%
TOTAL PROCESSING SERVICES	714	739	-3%	1375	1912	-28%	12%	17%
APPLICATION SOFTWARE	94	84	12%	468	504	-7%	32%	36%
TURNKEY SYSTEMS	389	303	28%	2300	1256	83%	34%	29%

line data base services. Micro-based products have also helped create demand in this sector as users find these systems limited.

- As with the insurance sector, INPUT predicts the turnkey systems market in this sector will maintain unit shipments but at a lower unit rate.
- Additionally, the turnkey vendor in this segment will be impacted by processing/network services vendors to a greater extent than previously projected. INPUT expects local and regional processing/network services vendors to develop quasi-turnkey products to address the services markets.

l. Federal Government

- INPUT's Federal Information Services Program also revealed new expenditures in the federal sector. Exhibit IV-13 shows increases of 55% and 60% for the remote computing/batch services mode. Although these are relatively small, the 1985 forecast is a more accurate reflection of the market.
- INPUT further expects turnkey vendors to benefit from the federal government's increasing posture to buy versus build, thus accounting for the increases in the projections in this sector.

m. State/Local Government

- The state and local government sector (see Exhibit IV-14) has a large variance in processing FM. This is due to a reclassification from federal government professional services FM. The contracts are mostly Medicare/Medicaid and are administered and awarded by states even though they are funded by federal agencies.
- The increases in the turnkey systems five-year forecast are solely a result of increasing the 1984 base expenditures. The 1984 base increase reflects systems sold to local governments and special districts at a higher level than forecasted in the previous report.

# EXHIBIT IV-13

## RECONCILIATION OF FEDERAL GOVERNMENT SECTOR INDUSTRY-SPECIFIC MARKET FORECAST

DELIVERY MODE	1984 MARKET      1990 MARKET						84-89 AAGR FORECAST	85-90 AAGR FORECAST
	1984 FORECAST (\$M)	1985 REPORT (\$M)	VARIANCE AS % OF '85 RPRT	1984 FORECAST (\$M)	1985 FORECAST (\$M)	VARIANCE AS % OF '85 FCST	IN '84 REPORT (%)	IN '85 REPORT (%)
TOTAL PROCESSING SERVICES	61	136	-55%	146	362	-60%	15%	18%
TOTAL APPLICATION SOFTWARE	19	17	6%	70	55	27%	26%	22%
TURNKEY SYSTEMS	227	412	-45%	1005	1230	-18%	30%	20%



# EXHIBIT IV-14

## RECONCILIATION OF STATE/LOCAL GOVERNMENT SECTOR INDUSTRY-SPECIFIC MARKET FORECAST

DELIVERY MODE	1984 MARKET			1990 MARKET			84-89 AAGR FORECAST	85-90 AAGR FORECAST
	1984 FORECAST (\$M)	1985 REPORT (\$M)	VARIANCE AS % OF '85 RPRT	1984 FORECAST (\$M)	1985 FORECAST (\$M)	VARIANCE AS % OF '85 FCST	IN '84 REPORT (%)	IN '85 REPORT (%)
PROCESSING SERVICES								
REMOTE COMPUTING/BATCH SERV.	49	51	-4%	85	160	-47%	10%	22%
FACILITY MANAGEMENT	8	257	-97%	13	659	-98%	10%	17%
TOTAL PROCESSING SERVICES	57	308	-81%	98	819	-88%	10%	18%
APPLICATION SOFTWARE	30	24	25%	103	84	23%	23%	25%
TURNKEY SYSTEMS	36	80	-55%	109	227	-52%	20%	20%

n. Other Industry-Specific Sectors

- Exhibit IV-15 reflects the other industry sectors and an increase of 29% in the long-range forecast. This increase is primarily due to the identification of more and more very small service companies with niche products ranging from multiple listing services for local realtors to paralegal support systems for legal firms. Although these are small, INPUT predicts an increase in this sector as more small firms grow and new ones emerge to serve these very small regional or local markets.
- The revisions in both applications software and turnkey systems reflect the general rationale stated in the introduction.

2. CROSS-INDUSTRY SEGMENT ANALYSIS

- Exhibits IV-16 through IV-21 show the reconciliation data for the cross-industry market segments. The following are comments on the major variances from last year's report.
  - As seen in Exhibit IV-2, the total segment has increased only slightly in the short term.
  - The long-term, five-year forecast projects an increase of 20%, which is largely a reflection of the strength of many of the traditional markets.

a. Planning and Analysis

- The planning and analysis segment (see Exhibit IV-16) variance of 28% is largely due to applications that are increasingly difficult to migrate to micro-based systems. INPUT now believes the "easy to migrate" erosion has mostly run its course. The remaining and emerging systems are multi-location, multi-user, and thus the value of the service is justified.

# EXHIBIT IV-15

## RECONCILIATION OF OTHER INDUSTRY-SPECIFIC SECTORS INDUSTRY-SPECIFIC MARKET FORECAST

DELIVERY MODE	1984 MARKET			1990 MARKET			84-89 AAGR FORECAST IN '84	85-90 AAGR FORECAST IN '85
	1984 FORECAST (\$M)	1985 REPORT (\$M)	VARIANCE AS % OF '85 RPRT	1984 FORECAST (\$M)	1985 FORECAST (\$M)	VARIANCE AS % OF '85 FCST	REPORT (%)	REPORT (%)
PROCESSING SERVICES								
REMOTE COMPUTING/BATCH SERV.	402	440	-9%	759	1075	-29%	11%	17%
FACILITY MANAGEMENT	8	8	0%	12	14	-14%	7%	9%
TOTAL PROCESSING SERVICES	410	448	-8%	771	1089	-29%	11%	17%
APPLICATION SOFTWARE	98	53	85%	593	275	116%	35%	32%
TURNKEY SYSTEMS	39	86	-55%	147	244	-40%	25%	20%

EXHIBIT IV-16

RECONCILIATION OF PLANNING AND ANALYSIS SEGMENT  
CROSS-INDUSTRY MARKET FORECAST

DELIVERY MODE	1984 MARKET			1990 MARKET			84-89 AAGR FORECAST IN '84 REPORT (%)	85-90 AAGR FORECAST IN '85 REPORT (%)
	1984 FORECAST (\$M)	1985 REPORT (\$M)	VARIANCE AS % OF '85 RPRT	1984 FORECAST (\$M)	1985 FORECAST (\$M)	VARIANCE AS % OF '85 FCST		
REMOTE COMPUTING/BATCH SERV.	621	725	-14%	1177	1626	-28%	9%	14%
APPLICATION SOFTWARE								
MAINFRAME/MINI	564	481	17%	2473	1596	55%	29%	21%
MICRO	334	564	-41%	2665	1294	106%	42%	14%
TOTAL APPLICATION SOFTWARE	898	1045	-14%	5138	2890	78%	34%	18%
TURNKEY SYSTEMS	203	210	-3%	742	602	23%	24%	20%

- Greater than expected sales of micro-based products resulted in the increase in applications software over the 1984 forecast. However, some leveling off is occurring. The long-term forecast has been sharply tempered due to:
  - Reduced forecasts for shipments of generalized microcomputers.
  - User satisfaction with current products is high and users appear reluctant to learn new systems.
  - Growing evidence of saturation of these systems.
  - The general direction of the software markets.
- The decrease in the turnkey systems forecast for 1985-1990 is a reflection of the overall turnkey market.

b. Accounting

- Exhibit IV-17 shows the accounting segment. The five-year projection has been increased 38%. There are several reasons for this:
  - Micro-based client write up systems for accountants have created a whole new service industry. These expenditures are now reflected.
  - Local and regional service providers are penetrating the low-end market for first-time users.
  - The applications software forecast is revised for 1985-1990 due to:
    - The strength of the processing/network services market that now appears able to retain customers better than in prior years.

## EXHIBIT IV-17

RECONCILIATION OF ACCOUNTING SEGMENT  
CROSS-INDUSTRY MARKET FORECAST

DELIVERY MODE	1984 MARKET			1990 MARKET			84-89 AAGR FORECAST IN '84 REPORT (%)	85-90 AAGR FORECAST IN '85 REPORT (%)
	1984 FORECAST (\$M)	1985 REPORT (\$M)	VARIANCE AS % OF '85 RPRT	1984 FORECAST (\$M)	1985 FORECAST (\$M)	VARIANCE AS % OF '85 FCST		
REMOTE COMPUTING/BATCH SERV.	900	922	-2%	1268	2058	-38%	6%	15%
APPLICATION SOFTWARE								
MAINFRAME/MINI	995	806	23%	2533	1785	42%	17%	14%
MICRO	172	195	-12%	1595	820	95%	45%	25%
TOTAL APPLICATION SOFTWARE	1166	1001	16%	4128	2605	58%	23%	17%
TURNKEY SYSTEMS	315	325	-3%	1248	590	112%	26%	20%



- Much lower than predicted price levels for micro-based accounting packages.
- Lower than expected prices for mainframe and minicomputer packages, especially generalized packages. This competitive impact is now expected to continue.
- The long-term outlook for turnkey systems has been reduced by half to reflect:
  - Lower turnkey unit prices, as previously discussed.
  - The general turnkey market conditions and the expectation that generalized systems like accounting will be the most vulnerable.

c. Human Resources

- Exhibit IV-18 reflects an increase of 23% for human resource systems. The primary reason is the strength of traditional payroll markets and the ability of these vendors to develop and sell add-on products.
- In addition to general market conditions previously discussed, the applications software and turnkey systems forecasts have been revised to reflect:
  - The strength and apparent stability of the processing/network services vendors.
  - An increasingly mature and competitive market environment.

## EXHIBIT IV-18

RECONCILIATION OF HUMAN RESOURCES SEGMENT  
CROSS-INDUSTRY MARKET FORECAST

DELIVERY MODE	1984 MARKET			1990 MARKET			84-89 AAGR FORECAST IN '84 REPORT (%)	85-90 AAGR FORECAST IN '85 REPORT (%)
	1984 FORECAST (\$M)	1985 REPORT (\$M)	VARIANCE AS % OF '85 RPRT	1984 FORECAST (\$M)	1985 FORECAST (\$M)	VARIANCE AS % OF '85 FCST		
REMOTE COMPUTING/BATCH SERV.	753	799	-6%	1233	1598	-23%	9%	12%
APPLICATION SOFTWARE								
MAINFRAME/MINI	447	362	23%	1247	768	62%	15%	13%
MICRO	34	35	-3%	151	107	41%	28%	22%
TOTAL APPLICATION SOFTWARE	481	397	21%	1398	875	60%	16%	14%
TURNKEY SYSTEMS	183	187	-2%	622	414	50%	23%	14%

d. Engineering/Scientific

- The engineering/scientific market forecast (see Exhibit IV-19) has been increased 34% from the previous forecast. The rationale is that more money was spent outside as companies constrained budgets for turnkey systems during the past year. These buyers also delayed decisions due to product proliferation and pricing manipulations of turnkey and software vendors. In terms of the five-year projection, this means:
  - For the early portion of the forecast, the above reasons will carry over, contributing to some of the increase.
  - The heaviest impact on this forecast is the belief that micro-based workstations will be selected over more powerful mini-based systems. The effect of this for processing/network services will be increased outside expenditures for those areas where more capacity is needed.
  - Another factor is the "sharing" of data and programs. For example, in manufacturing, the integration craze, CIM, is heating up. When integration occurs, it will result in the need to interface systems and locations. For the next five years, INPUT believes this provides opportunities for processing/network services vendors and justifies this substantial upward increase.
  - This segment is one of the most predictive in terms of the economy. Given the strength of the processing/network services area, companies want flexibility to control expenses. The result for the applications software and turnkey systems markets is:
    - A lower forecast to reflect this strength.
    - A lower forecast to reflect resistance to fixed expense.

## EXHIBIT IV-19

RECONCILIATION OF ENGINEERING/SCIENTIFIC SEGMENT  
CROSS-INDUSTRY MARKET FORECAST

DELIVERY MODE	1984 MARKET			1990 MARKET			84-89 AAGR FORECAST IN '84	85-90 AAGR FORECAST IN '85
	1984 FORECAST (\$M)	1985 REPORT (\$M)	VARIANCE AS % OF '85 RPRT	1984 FORECAST (\$M)	1985 FORECAST (\$M)	VARIANCE AS % OF '85 FCST	REPORT (%)	REPORT (%)
REMOTE COMPUTING/BATCH SERV.	608	790	-23%	1389	2116	-34%	15%	18%
APPLICATION SOFTWARE								
MAINFRAME/MINI	157	127	24%	488	436	12%	21%	24%
MICRO	26	26	0%	179	125	43%	38%	31%
TOTAL APPLICATION SOFTWARE	183	153	20%	667	561	19%	24%	25%
TURNKEY SYSTEMS	225	235	-4%	785	650	21%	23%	18%

- Fewer discretionary budgets for new software or new workstations.
- This softness is also a reflection of the previous strength of this segment and some level of saturation in engineering productivity markets. INPUT expects this to translate into strength in user demand in the industry-specific engineering segment.

e. Education/Training

- This segment update is based on the overall market conditions, but has been tempered slightly to reflect the underlying strength and user demand for education/training products and services.
- The main reason for the revisions to the five-year outlook, shown in Exhibit IV-20, is that a great deal of the user demand is for more traditional products and services including classroom and on-site training. While self-paced and other technologies have great appeal, INPUT believes the demand for the more traditional service will impact this market.

f. Other Cross-Industry Segments

- Exhibit IV-21 shows the final segment--other cross-industry applications. The increases in this segment are due primarily to the growing acceptance of voice-mail systems in the sales/marketing function.
- Applications software forecasts have been revised to reflect:
  - A lower 1984 base for mainframe/minicomputer products due to micro-based competition. The 1985-1990 growth rate is higher because of greater interest across the board for these products as a result of the market being created by microcomputers.

# EXHIBIT IV-20

## RECONCILIATION OF EDUCATION/TRAINING SEGMENT CROSS-INDUSTRY MARKET FORECAST

DELIVERY MODE	1984 MARKET			1990 MARKET			84-89 AAGR FORECAST IN '84	85-90 AAGR FORECAST IN '85
	1984 FORECAST (\$M)	1985 REPORT (\$M)	VARIANCE AS % OF '85 RPRT	1984 FORECAST (\$M)	1985 FORECAST (\$M)	VARIANCE AS % OF '85 FCST	REPORT (%)	REPORT (%)
REMOTE COMPUTING/BATCH SERV.	47	79	-41%	168	148	14%	24%	11%
APPLICATION SOFTWARE								
MAINFRAME/MINI	27	22	23%	197	138	43%	39%	36%
MICRO	38	38	0%	562	383	47%	57%	48%
TOTAL APPLICATION SOFTWARE	65	60	8%	759	521	46%	51%	44%
TURNKEY SYSTEMS	63	103	-39%	428	235	82%	38%	14%



## EXHIBIT IV-21

RECONCILIATION OF OTHER CROSS-INDUSTRY SEGMENTS  
CROSS-INDUSTRY MARKET FORECAST

DELIVERY MODE	1984 MARKET			1990 MARKET			84-89 AAGR FORECAST IN '84 REPORT (%)	85-90 AAGR FORECAST IN '85 REPORT (%)
	1984 FORECAST (\$M)	1985 REPORT (\$M)	VARIANCE AS % OF '85 RPRT	1984 FORECAST (\$M)	1985 FORECAST (\$M)	VARIANCE AS % OF '85 FCST		
REMOTE COMPUTING/BATCH SERV.	297	332	-11%	565	710	-20%	11%	14%
APPLICATION SOFTWARE								
MAINFRAME/MINI	220	150	47%	429	364	18%	12%	16%
MICRO	162	335	-52%	712	950	-25%	28%	20%
TOTAL APPLICATION SOFTWARE	382	485	-21%	1141	1314	-13%	20%	19%
TURNKEY SYSTEMS	955	995	-4%	3784	2230	70%	26%	15%

- Greater than expected demand for word processing and business graphics. The emergence of the desktop publishing products and services and the quality of these products is expected to contribute to the expansion of this segment.
- The turnkey systems market is now expected to decline, with the lower unit pricing again being a factor. The strength of these generalized desktop publishing systems will intercept some of the expenditure previously available to turnkey vendors.



## APPENDIX A: DEFINITIONS



## APPENDIX A: DEFINITIONS

- INFORMATION SERVICES--Computer-related services involving one or more of the following:
  - Processing of computer-based applications using vendor computers (called "processing services").
  - Services that assist users in performing functions on their own computers or vendor computers (called "software products" and/or "professional services").
  - Services that utilize a combination of hardware and software, integrated into a total system (called "turnkey systems").

### A. USER EXPENDITURES

- All user expenditures reported are "available" (i.e., noncaptive, as defined below).
- NONCAPTIVE INFORMATION SERVICES USER EXPENDITURES - Expenditures paid for information services provided by a vendor who is not part of the same parent corporation as the user.



- CAPTIVE INFORMATION SERVICES USER EXPENDITURES - Expenditures received from users who are part of the same parent corporation as the vendor.

## B. DELIVERY MODES

- PROCESSING SERVICES - This category includes remote computing services, batch services, processing facilities management, and value-added networks (VANs).
  - REMOTE COMPUTING SERVICES (RCS) - Providing computer processing to a user by means of terminal(s) at the user's site(s) connected by a data communications network to the vendor's central computer. There are four submodes of RCS, including:
    - Interactive - Characterized by the interaction of the user with the system for the purpose of problem-solving, data entry, and/or transaction processing. The user is on-line to the program/files. Computer response is usually measured in seconds or fractions of a second.
    - Remote Batch - A service in which the user hands over control of a job to the vendor's computer, which schedules job execution according to priorities and resource requirements. Computer response is usually measured in minutes or hours.
    - Data Base - Characterized by the retrieval and processing of information from a vendor-provided data base. The data base may be owned by the vendor or a third party.

- . User Site Hardware Services (USHS) - Offerings provided by RCS vendors that place programmable hardware on the user's site (rather than in the vendor's computer center). USHS offers access to a communications network, access through the network to the RCS vendor's larger computers, and significant software as part of the service.
- BATCH SERVICES - This includes computer processing performed at vendors' sites of user programs and/or data that are physically transported (as opposed to electronically by telecommunications media) to and/or from those sites. Data entry and data output services, such as keypunching and computer output microfilm processing, are also included. Batch services include those expenditures by users who take their data to a vendor site that has a terminal connected to a remote computer for the actual processing.
- PROCESSING FACILITIES MANAGEMENT (PFM) (also referred to as "resource management" or "systems management") - The management of all or a major part of a user's data processing functions under a long-term contract (more than one year). This would include both remote computing and batch services. To qualify as PFM, the contractor must directly plan, control, operate, and own the facility provided to the user, either on-site, through communications lines, or in a mixed mode.
- VALUE-ADDED NETWORKS (VANs) - VANs typically involve common carrier network transmission facilities that are augmented with computerized switching. These networks have become associated with packet-switching technology because the public VANs that have received the most attention (e.g., Telenet and TYMNET) employ packet-switching techniques. However, other added data service features such as store-and-forward message switching, terminal interfacing, error detection and correction, and host computer interfacing are of equal importance.

- Processing services are further differentiated as follows:
  - Cross-industry services involve the processing of applications that are targeted to specific user departments (e.g., finance, personnel, sales) but that cut across industry lines. Most general ledger, accounts receivable, payroll, and personnel applications fall into this category. Cross-industry data base services, for which the vendor supplies the data base and controls access to it (although it may be owned by a third party), are included in this category. General-purpose tools such as financial planning systems, linear regression packages, and other statistical routines are also included. However, when the application, tool, or data base is designed for specific industry use, then the service is industry-specific (see below).
  - Industry-specific services provide processing for particular functions or problems unique to an industry or industry group. Specialty applications can be either business or scientific in orientation. Industry-specific data base services, for which the vendor supplies the data base and controls access to it (although it may be owned by a third party), are also included under this category. Examples of industry-specific applications are seismic data processing, numerically controlled machine tool software development, and demand deposit accounting.
  - Utility services are those for which the vendor provides access to a computer and/or communications network with basic software that enables users to develop and/or process their own systems. These basic tools often include terminal-handling software, sorts, language compilers, data base management systems, information retrieval software, scientific library routines, and other systems software.

- SOFTWARE PRODUCTS - This category includes users' purchases of applications and/or systems software that is sold by vendors as standard products intended for use by different organizations. Included as user expenditures are lease and purchase expenditures as well as fees for work performed by the vendor to implement and maintain the package (when such fees are either bundled as part of the product price or offered on an annual subscription basis). Fees for work related to education, consulting, and/or custom modification of software products are counted as professional services, provided such fees are charged separately from the price of the software product itself. There are several subcategories of software products, including:
  - APPLICATIONS SOFTWARE PRODUCTS - Software that performs a specific function directly related to solving a business or organizational need. Applications software provides information directly for use by the end user. Applications software products classifications are:
    - Cross-Industry Products - Used in multiple user industry sectors. Examples are payroll, inventory control, and financial planning.
    - Industry-Specific Products - Used in a specific industry sector such as banking and finance, transportation, or discrete manufacturing. Examples are demand deposit accounting, airline scheduling, and materials resource planning.
  - SYSTEMS SOFTWARE PRODUCTS - Software that enables the computer/communications system to perform basic functions, which are interim steps to providing the end user with "answers" sought. Systems software product classifications are:
    - Systems Control Products - These products function during applications program execution to manage the computer system



resource. Examples include operating systems, communication monitors, and emulators.

- Data Center Management Products - These products are used by operations personnel to manage the computer system resources and personnel more effectively. Examples include performance measurement, job accounting, computer operations scheduling, and utilities.
- Application Development Products - These products are used to prepare applications for execution by assisting in design, programming, testing, and related functions. Examples include languages, sorts, productivity aids, data dictionaries, data base management systems, report writers, and retrieval systems.
- PROFESSIONAL SERVICES - This category is made up of modes in the following categories:
  - SOFTWARE DEVELOPMENT - This service develops a software system on a custom basis. It includes one or more of the following: user requirements, system design, contract, and programming.
  - EDUCATION AND TRAINING SERVICES - These services help people acquire new skills, techniques, or knowledge related to computers. This definition does not include services to educational institutions. (This latter market is included in the education (industry-specific) segment.)
  - CONSULTING SERVICES - Consultants advise clients on computer-related issues that are usually management oriented. Feasibility studies and computer audits are examples of services provided.

- PROFESSIONAL SERVICES FACILITIES MANAGEMENT (PSFM) - This is counterpart to processing facilities management, except that in this case the computers are owned by the client, not the vendor; the vendor provides human resources to operate and manage the client facility.
- TURNKEY SYSTEMS (also known as Integrated Systems) - A turnkey system is an integration of systems and applications software with CPU hardware and peripherals, packaged as a single applications solution. The value added by the vendor is primarily in the software and support. Most CAD/CAM systems and many small business systems are turnkey systems. This does not include specialized hardware systems such as word processors, cash registers, or process control systems, nor does it include Embedded Computer Resources for military applications. Turnkey systems are available either as custom or packaged systems.
  - Hardware vendors that combine software with their own general purpose hardware are not classified by INPUT as turnkey vendors.
  - Turnkey systems revenue is divided into two categories.
    - Industry-specific systems--that is, systems that serve a specific function for a given industry sector such as automobile dealer parts inventory, CAD/CAM systems, or discrete manufacturing control systems.
    - Cross-industry systems--that is, systems that provide a specific function that is applicable to a wide range of industry sectors such as financial planning systems, payroll systems, or personnel management systems.
  - Revenue includes hardware, software, and support functions.



- SYSTEMS INTEGRATION - Services associated with systems design, integration of computing components, installation, and acceptance of computer/communications systems. Systems integration can include one or more of the major information services delivery modes--professional services, turnkey systems, and software products. System components may be furnished by separate vendors (not as an integrated system by one vendor, called the prime contractor); services may be furnished by a vendor or by a not-for-profit organization. Integration services may be provided with related engineering activities, such as SE&I (Systems Engineering and Integration) or SETA (Systems Engineering and Technical Assistance).

### C.    HARDWARE/HARDWARE SYSTEMS

- HARDWARE - Includes all computer communications equipment that can be separately acquired, with or without installation by the vendor, and not acquired as part of a system.
  - PERIPHERALS - Includes all input, output, communications, and storage devices, other than main memory, that can be locally connected to the main processor and generally cannot be included in other categories, such as terminals.
  - INPUT DEVICES - Includes keyboards, numeric pads, card records, bar-code readers, lightpens and trackballs, tape readers, position and motion sensors, and A-to-D (analog-to-dialog) converters.
  - OUTPUT DEVICES - Includes printers, CRTs, projection television screens, microfilm processors, digital graphics, and plotters.
  - COMMUNICATION DEVICES - Modems, encryption equipment, special interfaces, and error control.

- STORAGE DEVICES - Includes magnetic tape (reel, cartridge, and cassette), floppy and hard disks, solid state (integrated circuits), and bubble and optical memories.
- TERMINALS - There are three types of terminals:
  - USER PROGRAMMABLE (also called "intelligent terminals"):
    - Single-station or standalone.
    - Multistation-shared processor.
    - Teleprinter.
    - Remote batch.
  - USER NONPROGRAMMABLE:
    - Single-station.
    - Multistation-shared processor.
    - Teleprinter.
  - LIMITED FUNCTION - Originally developed for specific needs, such as POS (point-of-sale), inventory data collection, controlled access, etc.
- HARDWARE SYSTEMS - Includes all processors, from microcomputers to super (scientific) computers. Hardware systems require type- or model-unique operating software to be functional, but the category excludes applications software and peripheral devices, other than main memory and processor or CPUs not provided as part of an integrated (turnkey) system.

- MICROCOMPUTER (or personal computer or PC) - Combines all of the CPU, memory, and peripheral functions of an 8- or 16-bit computer on a chip, in the form of:
  - . Integrated circuit package.
  - . Plug-in board with more memory and peripheral circuits.
  - . Console—including keyboard and interfacing connectors.
  - . Personal computer with at least one external storage device directly addressable by CPU.
- MINICOMPUTER - Usually a 12-, 16- or 32-bit computer, which may be provided with limited applications software and support, and may represent a portion of a complete large system.
  - . Personal business computer.
  - . Small laboratory computer.
  - . Nodal computer in a distributed data network, remote data collection network, connected to remote microcomputers.
- MAINFRAME - Typically a 32- or 64-bit computer, with extensive applications software and a number of peripherals in standalone or multiple CPU configurations for business (administrative, personnel, and logistics) applications, also called a General-Purpose Computer.
  - . Large computer mainframes are presently centered around storage controllers but likely to become bus-oriented and to consist of multiple processors (CPUs) or parallel processors;

they are intended for structured mathematical and signal processing, and are generally used with general-purpose von-Neumann-type processors for system control.

- . Supercomputer mainframes are high-powered processors with numerical processing throughput that is significantly greater than the largest general-purpose computers, with capacities in the 10-50 MFLOPS (million floating point operations per second) range, in two categories:
  - REAL TIME - Generally used for signal processing.
  - NONREAL TIME - For scientific use, with maximum burst-mode (but sustained speed) capacities of up to 100 MFLOPS, in one of three configurations:
    - . Parallel processors.
    - . Pipeline processors.
    - . Vector processors.
- Newer supercomputers--with burst modes approaching 300 MFLOPS, main storage size up to 10 million words, and on-line storage in the one-to-three gigabyte class--are also becoming more common.
- EMBEDDED COMPUTER - Dedicated computer system designed and implemented as an integral part of a weapon or weapon system, or platform, that is critical to a military or intelligence mission, such as command and control, cryptological activities, or intelligence activities. Characterized by MIL SPEC (military specification) appearance and operation, limited but reprogrammable applications software, and permanent or semipermanent interfaces. May vary in capacity from

microcomputers to parallel-processor computer systems. Information services forecasts in this report do not include applications for this type of computer.

#### D. TELECOMMUNICATIONS

- NETWORKS - Interconnection services between computing resources. Provided on a leased basis by a vendor to move data and/or textual information from one or more locations to one or more locations.
  - COMMON CARRIER NETWORK (CCN) - Provided via conventional voice-grade circuits and through regular switching facilities (dial-up calling) with leased or user-owned modems (to convert digital information to voice-grade tones) for transfer rates between 150 and 1,200 baud.
  - VALUE-ADDED NETWORK (VAN) - (See listing under Section B, Delivery Modes.)
  - LOCAL AREA NETWORK (LAN) - Restricted limited-access network between computing resources in a relatively small (but not necessarily contiguous) area, such as a building, complex of buildings, or buildings distributed within a metropolitan area. One of the two types:
    - BASEBAND - Voice bandwidth at voice frequencies (same as telephone, teletype system) limited to a single sender at any given moment and limited to speeds of 75 to 1,200 baud, in serial mode.
    - BROADBAND - Employs multiplexing techniques to increase carrier frequency between terminals, to provide:



- Multiple (simultaneous) channels via FDM (Frequency Division Multiplexing).
  - Multiple (time-sequenced) channels via TDM (Time Division Multiplexing).
  - High-speed data transfer rate via parallel mode at rates of up to 96,000 baud (or higher, depending on media).
- TRANSMISSION MEDIA - Varies with the supplier (vendor) and with the distribution of the network and its access mode to the individual computing resource location.
    - MODE - may be either:
      - ANALOG - Typified by the predominantly voice-grade network of AT&T's DDD (Direct Distance Dialing) and by operating telephone company distribution systems.
      - DIGITAL - Where voice, data, and/or text are digitized into a binary stream.
    - MEDIA varies with distance, availability, and connectivity:
      - WIRE - Varies from earlier single-line teletype networks to two-wire standard telephone (twisted pair) and balanced line to four-wire full-duplex balanced lines.
      - CARRIER - Multiplexed signals on two-wire and four-wire networks to increase capacity by FDM.



- COAXIAL CABLE - HF (High Frequency) and VHF (Very High Frequency), single frequency, or carrier-based system that requires frequent reamplification (repeaters) to carry the signal any distance.
- MICROWAVE - UHF (Ultra High Frequency) multichannel, point-to-point, repeated radio transmission, also capable of wide frequency channels.
- OPTICAL FIBER - Local signal distribution systems employed in limited areas, using light-transmitting glass fibers, and using TDM for multichannel applications.
- SATELLITES - Synchronous earth-orbiting systems that provide point-to-point, two-way service over significant distances without intermediate amplification (repeaters), but requiring suitable groundstation facilities for up- and down-link operation.
- CELLULAR RADIO - Network of fixed, low-powered two-way radios that are linked by a computer system to track mobile phone/data set units; each radio serves a small area called a cell. The computer switches service connection to the mobile unit from cell to cell as the unit moves among the cells.

#### E. OTHER CONSIDERATIONS

- When questions arise about the proper place to count certain user expenditures, INPUT addresses them from the user viewpoint. Expenditures are then categorized according to what users perceive they are buying.

- The standard industrial classification (SIC) codes are used to define the economic activity contained in generic sectors such as process manufacturing, insurance, or transportation.
- The specific industries (and their SIC codes) included under these generic industry sectors are detailed in Exhibit A-1.

## EXHIBIT A-1

## INDUSTRY SECTOR DEFINITIONS

INDUSTRY SECTOR	INDUSTRY SIC	INDUSTRY NAME
Discrete Manufacturing	23	Apparel
	25	Furniture
	27	Printing
	31	Leather
	34	Metal
	35	Machinery
	36	Electronics
	37	Transportation
	38	Scientific and Control Instruments
	39	Miscellaneous Manufacturing
Process Manufacturing	10	Metal Mining
	11	Anthracite Mining
	12	Coal Mining
	13	Oil and Gas Extraction
	14	Mining/Quarrying of Non-Metallic Minerals, except Fuels
	20	Food Products
	21	Tobacco
	22	Textile Products
	24	Lumber and Wood Products
	26	Paper Products
	28	Chemicals
	29	Petroleum
	30	Rubber and Plastics
	32	Stone, Glass, Clay
	33	Primary Metals

Continued

## EXHIBIT A-1 (Cont.)

## INDUSTRY SECTOR DEFINITIONS

INDUSTRY SECTOR	INDUSTRY SIC	INDUSTRY NAME
Transportation	40	Railroads
	41	Local Transit
	42	Motor Freight
	43	U.S. Postal Service
	44	Water Transportation
	45	Air
	46	Pipelines
	47	Transportation Services
Utilities	49	Electric, Gas, and Sanitary
Telecommunications	48	Communications
Wholesale Distribution	50	Durable Goods
	51	Nondurable Goods
Retail Distribution	52	Building Materials, Hardware
	53	General Merchandise
	54	Food
	55	Automotive and Gas Stations
	56	Apparel
	57	Furniture
	58	Eating and Drinking
	59	Miscellaneous Retail

Continued

EXHIBIT A-1 (Cont.)

INDUSTRY SECTOR DEFINITIONS

INDUSTRY SECTOR	INDUSTRY SIC	INDUSTRY NAME
Banking and Finance	60	Banks
	61	Credit Agencies
	62	Security and Commodity Brokers
	67	Holding and Investment Offices
Insurance	63	Insurance (Life, Health, Etc.)
	64	Insurance Agents
Medical	80	Health Services
Education	82	Educational Services
Services	73	Business Services (excluding information services companies themselves)
	89	Miscellaneous Services
Federal Government	N/A	As Appropriate
State and Local Government	N/A	As Appropriate

Continued

## EXHIBIT A-1 (Cont.)

## INDUSTRY SECTOR DEFINITIONS

INDUSTRY SECTOR	INDUSTRY SIC	INDUSTRY NAME
Other Industries	01-09	Agriculture, Forestry, and Fishing
	15-17	Construction
	65	Real Estate
	66	Combinations of Real Estate, Insurance, Loans, Law Offices
	70	Hotels, Rooming Houses, Camps, and Other Lodging Places
	72	Personal Services
	75	Automotive Repair, Services, and Garages
	76	Miscellaneous Repair Services
	78	Motion Pictures
	79	Amusement and Recreation Services, Except Motion Pictures
	81	Legal Services
	83	Social Services
	84	Museums, Art Galleries, Botanical and Zoological Gardens
	86	Membership Organizations



INPUT provides planning information, analysis, and recommendations to managers and executives in the information processing industries. Through market research, technology forecasting, and competitive analysis, INPUT supports client management in making informed decisions. Continuing services are provided to users and vendors of computers, communications, and office products and services.

The company carries out continuous and in-depth research. Working closely with clients on important issues, INPUT's staff members analyze and interpret the research data, then develop recommendations and innovative ideas to meet clients' needs.

Clients receive reports, presentations, access to data on which analyses are based, and continuous consulting.

Many of INPUT's professional staff members have nearly 20 years' experience in their areas of specialization. Most have held senior management positions in operations, marketing, or planning. This expertise enables INPUT to supply practical solutions to complex business problems.

Formed in 1974, INPUT has become a leading international planning services firm. Clients include over 100 of the world's largest and most technically advanced companies.

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